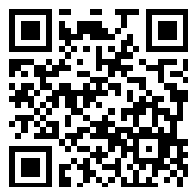

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MEDITERRANEAN PILOT

VOL. I

COMPRISING

THE SOUTHERN AND EASTERN COASTS OF
SPAIN FROM GIBRALTAR TO CAP CERBÈRE;
ISLAS BALEARES; SARDINIA; THE NORTHERN
COAST OF AFRICA FROM CEUTA TO RAS
AJDIR; ISOLA DI PANTELLERIA AND ISOLE
PELAGIE; THE MALTESE ISLANDS; ISOLE
EGADI; SICILY AND ISOLE EOLIE

EIGHTH EDITION

1951

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No. 6 **INTERNATIONAL CODE OF SIGNALS, 1931.**
Amendment.

No. 7 **CAUTION WITH REGARD TO SINGLE SHIPS
APPROACHING SQUADRONS OR AIRCRAFT
CARRIERS.**

No. 8 **WARNING SIGNALS TO DENOTE THE
PRESENCE OF SUBMARINES.**

No. 9 **NAVIGATIONAL AND GALE WARNINGS,
ETC., BROADCAST BY W/T AND R/T IN
GREAT BRITAIN AND IRELAND.**

No. 10 **MINESWEEPING OPERATIONS.**

No. 11 **BRITISH ISLES.—LIST OF STORM SIGNAL
STATIONS.**

No. 12 **SUBMARINE CABLES.**

No. 13 **INFORMATION ABOUT NAVIGATIONAL
WARNINGS.**

No. 14 **AVAILABILITY AT COMMERCIAL PORTS
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No. 16 **ADMIRALTY TIDE TABLES.**

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No. 17 **REPORTS OF SHOALS OBTAINED BY ECHO
SOUNDING.**

No. 18 **WARNING TO SHIPPING REGARDING
MINES.**

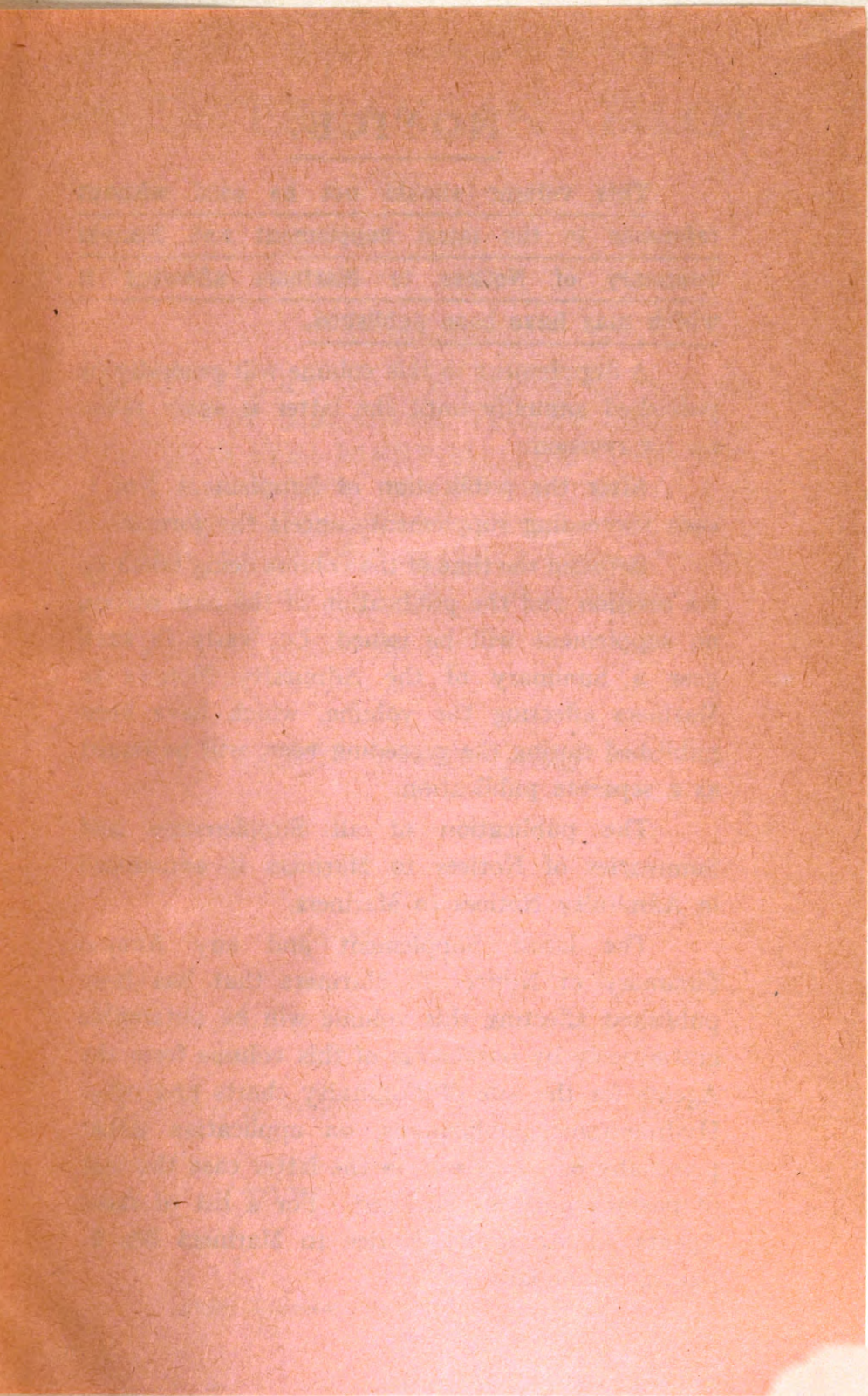
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SUMMARIES OF NOTICES TO MARINERS
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To be filled in by Navigating Officer.

(In Chart Depôts the first two columns are alone to be filled up.)

Title.	Date of Publication and Number.	Date of insertion of Note in Margins of Book.



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This volume should not be used without reference to the latest Supplement and Annual Summary of Notices to Mariners affecting it which may have been published.

A Supplement to this volume will generally be published annually until the latter is again taken up for revision.

After the publication of Supplement No. 1, each succeeding supplement cancels the former.

Between the time of the volume being taken up for revision and the publication of the new edition no supplement will be issued, but early in each year a Summary of the Admiralty Notices to Mariners affecting the volume, which have been published during the preceding year, will be issued as a separate publication.

The publication of all Supplements and Summaries of Notices to Mariners is announced in Admiralty Notices to Mariners.

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Gr. Brit. Hydrographic Office

MEDITERRANEAN PILOT

VOL. I

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AJDIR; ISOLA DI PANTELLERIA AND ISOLE
PELAGIE; THE MALTESE ISLANDS; ISOLE
EGADI; SICILY AND ISOLE EOLIE

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1951

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To face page ii.]

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CAUTION.

IN THIS WORK THE BEARINGS ARE REFERRED TO THE TRUE COMPASS, AND WHEN GIVEN IN DEGREES ARE RECKONED CLOCKWISE, FROM 000° (NORTH) TO 359°.

THE BEARINGS OF LIGHTS ARE GIVEN FROM SEAWARD.

THE LATITUDES AND LONGITUDES GIVEN IN THE TEXT ARE APPROXIMATE.

THE DISTANCES ARE EXPRESSED IN SEA-MILES OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO THE TENTH PART OF A SEA-MILE. IT IS OFTEN ACCEPTED AS BEING ONE-TENTH OF A NAUTICAL MILE.

THE DEPTHS ARE GIVEN BELOW CHART DATUM LEVEL WHERE NOT OTHERWISE STATED.

HEIGHTS ON THE LAND ARE GIVEN ABOVE MEAN LEVEL OF HIGH WATER SPRING TIDES.

FIGURES IN BRACKETS GIVEN AFTER THOSE DENOTING FEET, FATHOMS AND YARDS ARE THEIR EQUIVALENTS IN METRES.

TIME IS EXPRESSED IN THE FOUR-FIGURE NOTATION COMMENCING AT MIDNIGHT.

THE TERM "STEAM VESSEL" USED HEREIN INCLUDES ANY VESSEL PROPELLED BY MACHINERY.

A NAME IN BRACKETS, IMMEDIATELY FOLLOWING ANOTHER NAME, IS THE OBSOLETE NAME WHICH IS STILL SHOWN ON THE ADMIRALTY CHARTS. AS A GENERAL RULE, THE BRACKETED NAME IS ONLY INSERTED IN THE DESCRIPTION OF THE PLACE OR OBJECT PREVIOUSLY BEARING THAT NAME.

WHEN SHADING IS USED TO INDICATE COLOURS OF FLAGS, TIDAL LIGHT SIGNALS, OR BEACONS, IT IS AS FOLLOWS:



Yellow.



Red.



Blue.



Green.



Black.

ADVERTISEMENT TO EIGHTH EDITION

The Mediterranean Pilot, Vol. I, contains a description of the southern and eastern coasts of Spain, from Gibraltar to Cap Cerbère ; Islas Baleares ; Sardinia ; the northern coast of Africa from Ceuta to Ras Ajdir ; Isola di Pantelleria and Isole Pelagie ; the Maltese islands ; Isole Egadi ; Sicily ; and Isole Eolie.

This, the eighth edition, has been prepared by Commander F. N. Shearme, R.N., and contains the latest information received in the Hydrographic Department.

The meteorological information has been revised by the Meteorological Office of the Air Ministry. Temperature is expressed in degrees Fahrenheit, rainfall in inches, speed in knots, and distance in sea-miles, unless expressly stated otherwise. Information received from meteorological services which do not use these units has been converted into the units mentioned above by the Meteorological Office.

Mariners and others are invited to forward to the Hydrographer of the Navy, Admiralty, OXgate Lane, Cricklewood, London, N.W.2, any information that may come under their notice, which would be useful for the correction of the charts and other hydrographic publications issued by the British Admiralty ; *early* advice as to newly-discovered dangers, the establishment of, or changes in, any aids to navigation, is especially requested.

Copies of a form (H. 102) on which to render information can be obtained gratis from the Hydrographer of the Navy, Hydrographic Supplies Establishment, Creechbarrow House, Taunton, Somerset, or from any of the Admiralty Chart Agents in Great Britain and abroad, a list of whom is published, annually, in Admiralty Notice to Mariners No. 2.

By the publication of this volume, the seventh edition of the Mediterranean Pilot, Vol. I, 1937, and Supplement No. 9, 1950, are cancelled, and all information affecting that work contained in Notices to Mariners, up to and including No. 1313 of 1951, has been embodied in this volume ; for Temporary and Preliminary Notices to Mariners affecting this edition, the list of Temporary and Preliminary Notices to Mariners in force, published monthly in the weekly edition of the Admiralty Notices to Mariners, should be consulted.

A. DAY,
Rear-Admiral,
Hydrographer of the Navy.

Hydrographic Department,
Admiralty, London,
14th July, 1951.

BIBLIOGRAPHY

The following publications, other than those of the British Government, have been used in the compilation of this edition :—

BRITISH

The Statesman's Year Book, 1950.

SPANISH

Derrotero del Mediterráneo, Num. 3, 1950.

Faros y Señales de Niebla, Part II, 1949.

ITALIAN

Portolano del Mediterraneo, Volume 2°, Parte I, 1941, Supplemento N. 1, 1951.

Portolano del Mediterraneo, Volume 2°, Parte II, 1950, and Fascicolo Aggiuntivo, 1950.

Elenco dei Fari, Fanali, e Segnali da Nebbia, Mediterraneo, etc., 1950, and Fascicolo, 1950.

FRENCH

Instructions Nautiques, No. 360, 1948 ; Fascicule des Corrections, 1949.

Phares et Signaux de Brume, Serie D, 1948 ; Fascicule des Corrections, 1950.

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GLOSSARY

OF FOREIGN TERMS USED IN THIS VOLUME

A. = Arabic; F. = French; F. trans. = French transliteration;
I. = Italian; M. = Maltese; S. = Spanish; S. trans. = Spanish
transliteration

Ain	A.	Spring, well	Cala	I.	Creek, small bay
Albufera	S.	Saltwater lake	Cala	S.	Creek, cove
Alfaques	S.	Sandbank	Calanca	M.	Small cove
Ancoraggio . . .	I.	Anchorage	Caleta	S.	Small creek or cove
Anse	F.	Bay, creek	Caletón	S.	Large creek or cove
Arcipelago . . .	I.	Archipelago	Campo	S.	Any tract of flat country
Arrecife	S.	Reef	Canale, Canali .	I.	Canal, canals, channel
Arroyo	S.	Small river	Cap	F.	Cape, head-land
Atalaya	S.	High view-point	Capo	I.	Cape, head-land
Avant port . . .	F.	Outer harbour	Casa	S.	House
Bacino	I.	Basin	Caserio	S.	Group of houses, hamlet
Bahar	M.	Sea	Castel	I.	Castle
Bahia	S.	Bay, arm of the sea	Castel	S.	Castle
Baia	I.	Bay	Castellaccio . .	I.	Small castle fortress
Baida	A.	Desert	Castellazzo . .	I.	Small castle, fortress.
Baie	F.	Bay, gulf	Castello	I.	Castle
Bajo	S.	Shoal	Castellón	S.	Large castle
Banc	F.	Bank, sand-bank	Castillo	S.	Castle, fort
Banchina	I.	Quay, wharf	Cerro	S.	Hill, high land
Banco	I.	Sandbank	Chateau	F.	Castle
Banco	S.	Bank	Citta	M.	City
Barh	A.	Sea	Colonna	I.	Column, pillar
Barranco	S.	Fissure	Cueva	S.	Cave
Basse	F.	Shoal	Dahlet	M.	Inlet
Bassin	F.	Basin, dock	Danger	F.	Navigational danger
Bir	A.	Well	Dársena	S.	Wet dock, basin
Blanca	S.	White	Desierto	S.	Desert, wilderness
Blata	M.	Rock	Diga	I.	Dyke, bank, mole
Boca	S.	Mouth, entrance	Dique	S.	Mole, dock
Bocca	I.	Mouth, entrance			
Bocche	I.	Mouths, entrances			
Bordj, French form of Arabic Borj	F. trans.	Castle, fort, tower			
Cabezo	S.	Summit			
Cabo	S.	Cape, head-land, promontory			

Djebel, French form of Arabic Jebel	F. trans.	Hill, mountain	Jebel . . .	A.	Hill, mountain
Duar . . .	A.	Encampment	Jebla . . .	M.	Islet, point
Dunes . . .	F.	Shifting sandhills	Jetée . . .	F.	Jetty
			Jezirat . . .	A.	Island
Écueil . . .	F.	Rock, breaker	Kala . . .	M.	Cove
Ensenada . . .	S.	Bay, creek	Kalet . . .	M.	Cove
Entina . . .	S.	Shoal formed over wreck	Kantara . . .	A.	Bridge
Ermita . . .	S.	Hermitage	Kef . . .	A.	Rocky point
Escollo . . .	S.	Shallow rock			
Escull . . .	S.	Rocky shoal	Lago . . .	I.	Lake
Escullo . . .	S.	Rocky shoal	Laja . . .	S.	Flat rock
Escuy . . .	S.	Rocky shoal	Lajat . . .	S.	Flat rock
Espignón . . .	S.	Spur of mole	Lido . . .	I.	Shore, bank, countryside
Estanque . . .	S.	Pond	Llano . . .	S.	Plain
			Llosa . . .	S.	Enclosure
Falaise . . .	F.	Cliff	Loma . . .	S.	Hillock
Farallon . . .	S.	Pointed islet			
Faro . . .	I.	Strait	Macchia . . .	I.	Jungle, bushy place, thicket
Fáro . . .	I.	Lighthouse	Maison . . .	F.	House
Fiumára . . .	I.	River	Malecon . . .	S.	Dyke
Fiume . . .	I.	River	Mar . . .	S.	Sea, large lake
Fliegu . . .	M.	Channel	Marina . . .	I.	Seashore, strand, landing place, esplanade
Fom, Fomm . . .	M.	Mouth	Marina . . .	S.	Seaside place
Fondeadero . . .	S.	Anchorage	Marsa . . .	A.	Bay, cove, harbour
Fontaine . . .	F.	Spring, fountain	Marsa . . .	M.	Harbour
			Mers . . .	A.	Bay, cove, harbour
Forca . . .	M.	Gallows	Mersa . . .	A.	Bay, cove, harbour
Forte . . .	I.	Fort	Mesa . . .	S.	Tableland
Fortezza . . .	I.	Fortress	Mjiar . . .	M.	Inlet
Fortin . . .	S.	Small fort	Môle . . .	F.	Mole, pier
Fossa . . .	I.	Ditch, trench, grave	Moletto . . .	I.	Small mole
Freu . . .	S.	Narrow channel	Molo . . .	I.	Mole, pier, quay
Frontón . . .	S.	Front	Mont . . .	F.	Hill, mountain
Fuerte . . .	S.	Fort	Montagna . . .	I.	Mountain
			Montagne . . .	F.	Mountain
Gola . . .	S.	Gorge, mouth	Montaña . . .	S.	Mountain
Golfe . . .	F.	Gulf	Monte, Monti . . .	I.	Mountain, mountains
Golfo . . .	I.	Gulf, large bay	Monte . . .	S.	Large hill, mountain
Golfo . . .	S.	Gulf, large bay	Morne . . .	F.	Hill, hillock
Grao . . .	S.	Strand, shore	Morrillo . . .	S.	Pebble
Grotta . . .	I.	Cave, grotto	Morro . . .	S.	Anything that is round
Gzeira . . .	M.	Islet	Mouillage . . .	F.	Anchorage
Gzira . . .	M.	Island	Moulin . . .	F.	Mill
			Muelle . . .	S.	Mole, pier, jetty, quay, wharf
Hagra . . .	M.	Rock			
Haut-fond . . .	F.	Shoal			
Hotba . . .	M.	Uneven ground			
Iglesia . . .	S.	Church			
Île . . .	F.	Island			
Îlot . . .	F.	Islet			
Insenatura . . .	I.	Creek, cove			
Isla . . .	S.	Island			
Islote . . .	S.	Islet			
Isola, Isole . . .	I.	Island, islands			
Isolotto . . .	I.	Islet			

Olla	S.	Whirlpool	Rincón	S.	Corner, angle, small district
Ossario	I.	Charnel-house	Rio	S.	River
Oued, French form of Arabic Wad	F. trans.	Valley, river-bed, river	Roca	S.	Rock
Palazz	M.	Palace	Rocca	I.	Rock
Paseo	S.	Promenade	Roche	F.	Rock
Passe	F.	Channel	Rocher	F.	Rock
Passo	I.	Channel	Roquero	S.	Rocky
Peña	S.	Rock, large stone	Salina	I.	Saltwater lagoon, salt pan
Peñal	S.	Rock, large stone	Salina	S.	Saltpan
Penisola	I.	Peninsula	Salto	S.	Jumping-place
Peñon	S.	Large rock, rocky mountain	Scali	I.	Landing places, docks
Piano	I.	Flat, level, smooth	Scalo	I.	Landing place, dock
Pic	F.	Peak	Scogli	I.	Plural of Scoglio
Picacho	S.	Summit	Scogliera	I.	Reef of rocks awash
Picco	I.	Peak	Scoglio, Scogli	I.	Rock, reef, rocks, reefs
Pico	S.	Peak, summit	Scuola	I.	College, school
Piedra	S.	Stone	Sebkha	A.	Salt lake
Pietra	I.	Stone	Secca	I.	Shoal, sand-bank, reef
Piton	F.	Peak, summit	Secca	M.	Bank, shoal
Placer	S.	Bank	Seno	I.	Cove, creek, small bay
Plage	F.	Beach, shore	Serrania	S.	Mountain ridge, mountainous country
Playa	S.	Beach, shore	Sicca	M.	Bank, shoal
Pointe	F.	Point	Sidi	A.	Tomb
Ponta	M.	Point	Sierra	S.	Mountain ridge, range
Ponte	I.	Bridge	Skoll	M.	Rock
Pontile	I.	Pier	Skoli	M.	Rocks
Port	F.	Port, harbour	Sommet	F.	Summit
Porticciolo	I.	Small harbour	Stagno	I.	Marsh
Porto	I.	Port, harbour	Stretto	I.	Strait
Pozo	S.	Well	Surgidero	S.	Anchorage, roadstead
Pozzo	I.	Well	Tajo	S.	Cut or opening in a mountain
Presqu'île	F.	Peninsula	Taktigha	M.	Submerged rock, islet
Promontorio	I.	Promontory, headland	Tarf	A.	Cape
Promontorio	S.	Promontory, headland	Testa	I.	Head (of a rock)
Pueblo	S.	Town, village	Tombeau	F.	Tomb
Puerto	S.	Port	Torre	I.	Tower
Punta	I.	Point, peak	Torre	S.	Tower
Punta	S.	Point, headland, promontory	Torrente	I.	Torrent, rapid stream
Qalla	M.	Cove	Torrente	S.	Torrent, rapid stream
Qolla	M.	Hill	Torreon	S.	Round tower
Quai	F.	Quay, wharf			
Rada	I.	Roadstead			
Rada	S.	Roadstead			
Rade	I.	Roadstead			
Rambla	S.	Sandy beach			
Ramla	M.	Sandy beach			
Ras	A.	Cape, point			
Ras	M.	Cape			
Ravin	F.	River bed, bed of stream			
Restinga	S.	Reef			
Riachuelo	S.	Small river, stream			
Riera	S.	Ravine			

Torri . . . M. Tower
 Tour . . . F. Tower

Uad, Spanish S. Valley,
 form of trans. river-bed,
 Arabic Wad river

Varadero . . . S. Slipway
 Villa . . . F. Country house
 Villa . . . I. Country house
 Villa . . . S. Town, country
 house

Villino . . . I. Small country
 house

Wad, Wadi . . A. Valley,
 river-bed,
 river

Wied . . . M. Valley

Yebel, Spanish S. Hill, mountain
 form of trans.
 Arabic Jebel

SYSTEM OF ORTHOGRAPHY

The following rules for the spelling of geographical names (termed the R.G.S. II system) have been adopted for British official use, and the names in Admiralty Hydrographic publications will be rendered in accordance with these rules as opportunity occurs.

In new editions of the various volumes of sailing directions names are, generally speaking, given in accordance with these rules, but where the name on the chart shows an older rendering of a name, such chart name is given in brackets after the new rendering and will also be given in the Index.

The rules for spelling in the R.G.S. II system are as follows :—

- (1) The spelling of every place-name in an independent country or self-governing dominion using the Roman alphabet (including “Roman” alphabets containing extra or modified letters, such as Czech, Serb-Croat, Polish, Romanian, etc.) shall be that adopted by the country or dominion.
- (2) In colonial possessions the spelling of such place-names as belong to languages coming under Rule (1) will be spelt in accordance with that rule.
- (3) The accents and diacritical marks in official use by the above countries will be retained. Wherever it appears desirable, the pronunciation will be shown by giving the name as transliterated on the system below.
- (4) All other place-names throughout the world will be spelled in general accordance with the following system.

The broad features of this system are

- (a) That vowels are pronounced as in Italian and consonants as in English :
- (b) That every letter is pronounced, and no redundant letters are used.

This system aims at giving a close approximation to the *local* pronunciation ; but it is recognised that in some languages, notably Russian, Greek, and Arabic, the necessity for letter-for-letter transliteration often renders this impossible.

TABLE OF SPELLING AND PRONUNCIATION R.G.S. II.

a	The long and short Italian vowels, as in <i>lāvā</i> ..	Somāli; Rāvennā.*
ā	Between <i>a</i> in <i>fat</i> and <i>e</i> in <i>eh</i> ?; chiefly in Teutonic and Finno-Ugrian languages	Mähring; Pärnu.
ai	The two Italian vowels, frequently diphthongal, almost as in <i>aisle</i> ; but pronounced <i>ei</i> and <i>ē</i> in Greek names.. .. .	Wadai; Shanghai.
au	The two Italian vowels; frequently diphthongal; almost as <i>ou</i> in <i>out</i>	Sakau; Bauchi.
aw	When followed by a consonant, or when terminal, as in <i>awl</i> , <i>law</i>	Dawna; Saginaw.
b	As in English.	
c	Not to be used, but always replaced by <i>k</i> or <i>s</i> ; except in the compound <i>ch</i> , and in many conventionally-spelt words, as	Iandahar; Serang. Calcutta; Celébes.
ch	As in <i>church</i> ; never <i>tch</i> or <i>tsch</i> for this sound ..	Chad; Kerch.
ç	As in English.	
dh	Soft <i>th</i> as in <i>they</i> ; a slight <i>d</i> sound sometimes preceding it in Semitic languages	Hadhramaut; Riyadh.
e	Long as in <i>eh</i> ? short as in <i>bet</i> . (For the <i>e</i> sound in the French <i>je</i> , see note at end on the "neutral vowel.")	Gēlo; Mafeking.*
(ee)	Used for <i>i</i> (<i>q.v.</i>) only in a few conventional names	Darjeeling; Keelung.
ei	The two Italian vowels, frequently diphthongal as in <i>rein</i> , but pronounced <i>i</i> in Greek names ..	Beirut; Raheita.
(eu)	Not used as a single sound.	
f	As in English; <i>ph</i> must not be used for this sound	Mustafa; Maidan-i-Naftun.
g	Hard, as in <i>get</i> , <i>gift</i> : never as in <i>gem</i> , <i>gin</i> ..	Gedāref; Gilgit.
gh	Soft guttural, the Arabic <i>ghain</i>	Ghadames; Baghdad.
h	Used only when sounded; or in the compounds <i>ch</i> , <i>dh</i> , <i>gh</i> , <i>kh</i> , <i>sh</i> , <i>th</i> , <i>zh</i>	Ahmadabad; 'Abdullah.
i	Long as in <i>marine</i> ; short as in <i>piano</i>	Fiji; Kibonde.
j	As in English; except in transcription of Chinese, where it equals <i>zh</i> , or the French <i>j</i>	Juba, Ujiji (Eng. <i>j</i>); but Jaoping (Fr. <i>j</i>).
k	As in English; hard <i>c</i> should never be used (except in conventionally-spelt words)—thus, not Corea, Cabul, but	Korea; Kabul.
kh	Hard aspirated guttural, as in the Scottish <i>loch</i> (not as in <i>lock</i>)	Khan; Sebkhā.
l	As in English.	
m	As in English.	
n	As in English.	

*The long and short symbols given here are merely for explanation, not for use.

†See note at end on *Liquid Sounds*.

- ng** Has three separate sounds, as in *vanguard*, *finger*, and *singer*. If necessary to distinguish, a hyphen may be placed, as in *van-guard*, *singer-* .. In-galla; Bongo; Ng-ami; Tong-a.
- ngg** May be used for the sound of *ng* as in *finger* .. Trengganu; Yanggang-a.
- o** Long as in *both*¶: short as in *rotund* Kigōma; Höndölulu.*
- ō** As in German; equals the French *eu* in *peu*; or nearly the English sound in *fur* Barköl.
- (oo)** Used for *u* (*q.v.*) only in a few conventional names, chiefly Indian and Chinese Poona; Foochow.
- oi** The two Italian vowels; frequently diphthongal as in *oil*, but pronounced like *i* in *fit* in Greek names .. Hanoi.
- öi** The diphthong as in French *oeil* and Norwegian *høi* .. Höiland.
- ou** Dissyllabic, and not as French or English *ou*, except in Greek names where it has the French value .. Zlatoust; Yaroua.
- ow** Used as a diphthongal combination of *ō* and *w* only in the romanisation of Chinese Hankow.
- p** As in English.
- ph** As in *loophole*; not to be used for the *f*-sound, except conventionally Chemulpho; Haiphong.
- q** Represents *only* the Arabic *qaf* and the Hebrew *qof*; i.e. a guttural *k* (as a rule) Qena; Qiryath.
- qu** Should never be employed to represent the sound of *kw*; thus, not Namaqua, Quorra, but Namakwa; Kworra.
- r** As in English; should be distinctly pronounced.
- s†** As English *ss* in *boss*, not as in *these* or *pleasure* .. Burgos; Masikesi.
- sch** As in *discharge* Peschanka.
- sh**
tt† } As in English.
- th** Hard *th* as in *thick*, not as in *this* (except conventionally in Fijian) 'Athlith; Thingvellir.
- u** Long as in *rude*, or as *oo* in *boot*; short as in *pull* .. Zülü; Rüanda.*
- ü** As in German: equals the French *u*, as in *tu* (Fr.) .. Üsküdar.
- v**
w
x } As in English.
- y** Always a consonant, as in *yard*; it should not be used as a terminal vowel, *e* or *i* being substituted; e.g. not Kwaly or Wady, but Kwale; Wadi.
- z** As in *gaze*, not as in *azure*.
- zh** As the *s* in *treasure*, the *z* in *azure*, or the French *j* in *je*; but for the sound in Chinese use *j* (*vide* note about under *j*) Zhob.

*The long and short symbols given here are merely for explanation, not for use.

†See note at end on *Liquid sounds*.

¶The true Italian *ō* is broader than this; almost as in *broth* (= R.G.S. II *aw*). The letter *o* is conventionally used for this sound in certain names in Nigeria, Tonga, etc.: e.g. Oyo, Fofoa.

NOTES.

The doubling of a vowel or a consonant is only necessary when there is a distinct repetition of the single sound, and should otherwise be avoided

Nuusafee ; Moorea ;
Jidda ; Muhammad.

Accents should not generally be employed ; but in order to indicate or emphasize the stress, an acute accent may be used

Saráwak ; Qántara ;
Tong-atábu ; Paraná.

A long or short mark over a vowel (e.g. ā, ō) should only be used (and that sparingly) when without it there would be danger of mispronunciation ..

Kūt ; Kyōto ; Abóso.

Hyphens will not be used except to indicate pronunciation and with the particle *-i-* (in Persian, Fijian, etc.)

Ta-if ; Pusht-i-Kuh ;
Nuku-i-Ra.

Inverted comma and apostrophe.—The inverted comma ‘ is employed only to represent the Arabic *‘ain*, the Maltese *‘ghain*, and the Hebrew *‘ayin*. The apostrophe ’ in foreign words indicates a liquid sound (*see* below).

Liquid sounds.—The occasional “liquid” or “palatalised” sound of *d*, *l*, *n*, *s*, *t*, etc. (as in *d’you*, *lure*, *new*, *pursue*, *tune*, etc.) is as a rule sufficiently represented by a following *y* ; where, however, owing to a following consonant, or to the palatalised letter coming at the end of a word, the *y* is inapplicable, the liquid sound will be represented by an apostrophe, thus : *d’*, *l’*, *n’*, *s’*, *t’*, etc.

The “Neutral vowel.”—The “indeterminate” or “neutral” vowel sound (*er*), i.e. the sound of *a* in *marine*, *e* in *often*, *i* in *stir*, *io* in *nation*, *o* in *connect*, *ou* in *curious*, *u* in *difficult*, etc., *e* in French *je*, or the often unwritten vowel (*Fat-ha*) in Arabic, etc., is represented as a rule by *a* : as in Basra, Hawiya ; but sometimes by *e*, when the sound approximates more to *e* than to *a* : as Meshed, El Gezira.

(In any guide to pronunciation issued by the Permanent Committee on Geographical Names, the “neutral vowel” is represented generally by the italic *e* : occasionally also by italic *a* or *u*.)

This sound must not be confused with *e-mule*, where the *e* is not sounded at all : as in Abbeville.

Nasal vowels.—In illustrating the pronunciation of French, Portuguese, Polish, etc., nasal vowels, the nasalisation will be represented by italic *n*, as Czesztochowa pr. Chānstokhóva.

Note.—The Royal Geographical Society has published a book entitled “Alphabets of Foreign Languages transcribed into English according to the R.G.S. II system.” This book enables the correct rendering of names to be obtained, also of names in languages which are transliterated letter for letter.

INFORMATION RELATING TO ADMIRALTY CHARTS AND PUBLICATIONS, GENERAL NAVIGATION, AND GENERAL METEOROLOGY.

ON THE CORRECTION OF ADMIRALTY CHARTS.

Guides to Navigation.—In addition to the charts, the navigational publications which are primarily affected by the continual changes and alterations that take place are the Admiralty Sailing Directions, the Admiralty List of Lights, Fog Signals and Visual Time Signals, and the Admiralty List of Radio Signals. The Admiralty Notices to Mariners contain information mainly for the correction of the charts and navigational publications. 5

CHARTS.

1. Degree of Reliance.—It should be clearly understood that the value of a chart depends on the character of the original survey and on the completeness of the reports of subsequent changes. The remarks on "The Use of Charts as Navigational Aids, &c.", which are subjoined should be carefully studied in this connection. 10

2. System of Dating and Issue of Corrected Copies.—15 Admiralty charts after first publication, are kept corrected by means of new editions, large corrections, and small corrections. Copies of charts issued by the Hydrographic Supplies Establishment, Admiralty Chart Agents or Admiralty Chart Depôts are corrected, except from temporary and preliminary Notices to Mariners, for all navigational information to the date of issue. 20

New Charts.—The date of publication of a chart is shown outside the bottom margin, in the middle, e.g. :—

Published at the Admiralty 30th May, 1947.

New Editions.—When a chart is revised throughout and modernised in style a new edition is published, the date being shown outside the bottom margin and to the right of the date of publication, e.g. :— 25

New Edition 2nd Jany., 1947.

All large and small corrections notations are at the same time erased, and all old copies of the charts are cancelled. 30

Large Corrections.—When a chart is corrected from important information which is too comprehensive to promulgate by Admiralty Notice to Mariners or to insert conveniently by hand on existing copies, but when the chart is not revised throughout, the date on which these corrections are made is shown on the chart outside the bottom margin and to the right of the date of publication, and in the case of a chart already marked with a new edition date, below such date, e.g. :— 35

Large corrections 10th Feb., 1947.

All small corrections notations are at the same time erased, and all copies of the chart are cancelled.

Small corrections.—

- 5 (i) When a chart is corrected from the information promulgated in an Admiralty Notice to Mariners (except temporary and preliminary Notices), the year, if not already shown, and number of the notice are entered in the bottom left-hand corner of the chart, e.g. :—

Small corrections 1947-903.

- 10 Copies of the chart stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are corrected by hand from such information.

- 15 (ii) When a chart is corrected from information which is considered of no importance from the standpoint of safe navigation, and which is, therefore, not promulgated in an Admiralty Notice to Mariners, the year, if not already shown, and date of the correction are entered on the chart, in one of two ways, in the bottom left-hand
20 corner below the margin and in sequence, with the notations referred to in the preceding paragraph, e.g. :—

Small corrections, 1947—5.20—

or Small corrections 1947—(VI.25)

- 25 These indicate that the chart received minor corrections on the 20th May or 25th June, respectively.

- In such cases copies of the chart held by ships and establishments are not usually replaced by new copies, but in exceptional cases, e.g., when new compasses are inserted, new copies of the charts may be supplied. It
30 should, however, be particularly noted that the absence of corrections represented by square or bracket dates from a chart does not invalidate it for navigation.

- 3. Correction of Charts in Ships.**—All small but important corrections affecting navigation that can be made to the charts by
35 hand are promulgated in Admiralty Notices to Mariners and, with the exception of corrections from temporary or preliminary Notices, should at once be neatly made in waterproof violet ink on the charts affected, the year (if not already shown) and numbers of the notices being inserted, also in waterproof violet ink, in the bottom
40 left-hand corner of the chart. The recognised abbreviations shown on Admiralty chart No. 5011 ("Signs and abbreviations used on Admiralty Charts") should be used.

Generally speaking, the amount of information which should be inserted on a chart should be in accordance with that already shown.

- 45 *On large scale charts*, the abridged descriptions, as shown on chart No. 5011, of all details of all lights, light-buoys and fog signals, and the year dates of obstructions, reported shoals, dredged channels, depth on bars or in shifting channels, and irregularities of lights, should be inserted.

- 50 *On coastal charts*, the abridged descriptions of only the principal lights and fog-signals, i.e., those to assist in approaching or making the land, should be inserted.

Particulars of such lights should be omitted, in the following order, as the scale of the chart decreases, viz. :—

- (i) Elevation, (ii) Period, (iii) Number in Group, and (iv) Visibility.

Particulars of fog signals should be inserted in their appropriate positions if space permits, but should otherwise be entered in a tabulated list under the title or some other convenient place on the chart. 5

Inner harbour light-buoys and beacons should not be inserted on coastal charts, and against other light-buoys only the character of the light should be inserted. 10

On ocean charts, lights which are visible 15 miles or over should alone be inserted and then only their character and colour.

On all charts, writing should be inserted as much as possible clear of the water, unless the relative objects are on the water and care should be taken not to obliterate any information already on the chart. 15 When cautionary or tidal notes, &c., are inserted, they should be written in a convenient but *conspicuous* place, preferably near the title, where they will not interfere with other details.

Erasures should never be made but the details should, when necessary be crossed through in waterproof violet ink. 20

Admiralty Notices to Mariners are occasionally accompanied by reproductions of portions of charts (known as "blocks"), and when correcting charts from such blocks the following points should be borne in mind :—

- (i) A block may not only indicate the insertion of new information, *but also the omission of matter previously shown*. The latter would, however, invariably be mentioned in the text of the Notice, and the fact that a block accompanies a Notice should not cause the text of the Notice to be disregarded. 25 30
- (ii) The limiting lines of a block are determined for convenience of reproduction and need not be adhered to when cutting out for pasting on the chart, provided that the point mentioned in the preceding paragraph is taken into consideration. 35
- (iii) The new information shown on a block can sometimes be inserted on the chart by hand, the reason for issuing a block in such a case being to avoid a long description of the new information in the text of the Notice.
- (iv) Owing to distortion the blocks do not always fit the charts exactly, care should therefore be taken when pasting a block on to a chart that the more important navigational corrections fit as closely as possible. This can best be assured by fitting the block while it is dry and making two or three pencil ticks round the edges for use as fitting marks after the paste is applied. 40 45

Corrections from Temporary or Preliminary Notices to Mariners should be inserted on the charts *in pencil* and the year and number of the notice should be shown against them, e.g. :—N.M. 625/1947 temp. and also in the bottom left-hand corner of the chart, in pencil, 50 *below* the small corrections notations (*see above*). Temporary corrections should be rubbed out when the notice is received cancelling them, but preliminary corrections should be inked in when the notice is received reporting that the changes have been made.

Charts stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are *not* corrected from Temporary or Preliminary Notices to Mariners, and when charts are received from one of these sources they should be
 5 corrected in pencil as necessary from the copies of such Notices already held, or from those supplied with the charts.

Corrections from Radio Navigational Warnings concerning derelicts and drifting obstructions, the temporary extinction of lights, displacement of important aids to navigation, ice reports, &c., should also be
 10 noted *in pencil*, as received, on the charts affected. Radio Navigational Warnings of a permanent nature and those relating to derelicts and drifting obstructions dangerous to navigation are re-issued in the form of Admiralty Notices to Mariners, but other warnings are not re-issued in this way, except in special circumstances.

15 Corrections from information received from authorities other than the Admiralty should be noted, *in pencil*, on the charts affected, but no charted danger is to be expunged without the authority of the Hydrographer of the Navy.

NAVIGATIONAL PUBLICATIONS.

20 1. **Admiralty Sailing Directions, Supplements, &c.**—The Admiralty Sailing Directions, consisting of about 73 volumes for the whole world, contain general information useful to the navigator.

An index chart bound near the beginning of each volume shows the area dealt with and the serial numbers and limits of all Admiralty charts
 25 for the area which were published *when the volume was printed*.

Each volume is periodically revised throughout, and, in the intervals between the publication of new editions, Admiralty Notices to Mariners and Supplements are published to enable the volume to be corrected. It should, however, be clearly understood that Sailing Directions cannot
 30 be correct in all minor details after the date of the latest Supplement.

The above-mentioned corrections are not made in the Sailing Directions stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts.

A new edition of each volume of Sailing Directions is published at
 35 intervals of approximately from ten to twelve years. The number of the latest Admiralty Notice to Mariners used in its compilation is given in the "Advertisement" on page iii of each volume, and the numbers of the Notices affecting it between the dates of going to press and issue to ships and establishments are given in the Notice
 40 announcing its publication, to enable the new edition to be corrected before being brought into use.

A Supplement to each volume is generally published annually, each succeeding Supplement cancelling the former. When a volume is taken up for revision, however, no further Supplement to that edition
 45 is issued, but subsequent Notices to Mariners affecting it are summarised each year and issued as a separate publication, until the new edition of the volume is published.

A tabular form for notation of the existence of Supplements and Summaries of Notices is printed on the front fly-leaf of all Sailing
 50 Directions, and these notations are made as necessary in all copies issued by the Hydrographic Supplies Establishment and the Admiralty Chart Depôts.

Supplements and Summaries of Admiralty Notices to Mariners should be retained intact. *Whenever reference is made to the Sailing*

Directions, the Supplement and where applicable, the Summary, must be consulted. The existence of a Supplement or Summary of Admiralty Notices to Mariners is to be entered in the tabular form inside the cover of the Sailing Directions. New and amended information appearing in the Supplements for the first time is indicated by square brackets, and deletions from the previous Supplement are indicated by horizontal lines. 5

Admiralty Notices to Mariners affecting Sailing Directions *are not* to be cut up and pasted in, but the book is to be annotated in the margin, or corrected in manuscript, as convenient. 10

2. The Admiralty List of Lights, Fog Signals and Visual Time Signals.—The Admiralty List of Lights, Fog Signals and Visual Times Signals for the world is issued in twelve volumes divided geographically as shown on the index chart at the beginning of each volume. 15

Light-buoys are *not* included in the list.

The volumes are published annually at the rate of one volume per month commencing with Volume I in January and ending with Volume 12 in December. Supplements to these volumes will not be issued. 20

Each volume will be issued with an inscription on its cover and title page stating the date to which the volume has been corrected, which will be approximately six weeks prior to the date of its issue. Permanent and temporary corrections or additions to each volume, which may occur between the date of correction and date of issue, will be promulgated by Section III of Admiralty Notices to Mariners. 25

Amendments.—Important amendments are promulgated in Admiralty Notices to Mariners. In Section III of each Weekly Complete Edition of these Notices will be found all additions and alterations made to Lights, Fog Signals and Visual Time Signals by the Notices issued during the week affected; certain other additions and alterations are also included in Section III, which, though not of sufficient importance to necessitate the issue of a Notice to Mariners, will be found of use to the seaman. 30

Corrections to the Light Lists should be made in pencil, or extracted from Section III and pasted in the appropriate volume. 35

Note.—Corrections are not made in copies of the Lists of Lights, &c., stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Dépôts, and copies received from these sources should accordingly be corrected from the weekly editions of the Notices to Mariners before being brought into use. 40

3. The Admiralty List of Radio Signals.—The Admiralty List of Radio Signals is issued in three volumes.

Volume I.—Communications—Comprises particulars of radiotelegraph coast stations, together with general regulations; it also includes such subsidiary services as medical advice supplied by radio, together with details of the organisation for transmitting British official messages to merchant ships. 45

Volume II.—Navigational Aids—Comprises particulars of services from direction-finding stations, radiobeacons, and radio navigational aids (position fixing systems) together with radio time signals and navigational warnings (with ice signals); all relevant codes and regulations will be found in this volume. 50

Volume III.—Meteorological Services—Comprises particulars of weather services provided for the use of shipping, together with relevant codes and lists of meteorological observation stations. 55

New editions of each volume will normally be published annually.

A Supplement to each volume is also issued. These Supplements embody corrections subsequent to the date of going to press and are issued gratis with each volume. All corrections later than those included in the Supplements are promulgated in Section VI of the complete weekly edition of Admiralty Notices to Mariners.

Copies of the List stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts are not kept corrected, and Lists received from these sources should accordingly be corrected from the Supplements and from the weekly editions of the Admiralty Notices to Mariners before being brought into use.

4. The Admiralty Tide Tables.—The Admiralty Tide Tables are published in three sections as follows:—

For "HOME WATERS (British Isles, Europe and north coast of Africa".

For "ATLANTIC AND INDIAN OCEANS".

For "PACIFIC OCEAN AND ADJACENT SEAS".

Each section contains two parts, Part I giving tidal predictions for Standard Ports and tidal stream predictions for certain straits and channels. Part II giving data for predicting tides at places which are not Standard Ports.

Admiralty Tide Tables, Part III, contains instructions for predicting tides and tidal streams, and for analysing observations of tides and tidal streams, with tables to assist prediction and analysis.

25 THE USE OF CHARTS AS NAVIGATIONAL AIDS AND GENERAL REMARKS RELATING TO PRACTICAL NAVIGATION.

(1) **Reliance on a chart.**—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based, and this becomes more important the larger the scale of the chart.

To estimate this the date of the survey, which is always given in the title, is a good guide. Besides the changes that, in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier surveys were mostly made under circumstances that precluded great accuracy of detail, and, until a plan founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well-frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have been found. The fullness or scantiness of the soundings is another method of estimating the completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.

It appears to be insufficiently realised that the degree of reliance which may reasonably be placed upon an Admiralty chart, even in surveys of modern date, is mainly dependent on the scale on which the survey was made. The scale for publication is now generally that of the original survey, except in the case of coast sheets which are sometimes reduced. It should not, therefore, be assumed that the original survey was made on a larger scale than that published.

It must be borne in mind that the principal method of ascertaining the inequality of the bottom of the sea is by the laborious process

of sounding, and that in sounding over any area, the boat or vessel obtaining the soundings is kept on given lines; that each time the lead descends, or a sonic sounding is taken, the depth over only a small area is obtained, in the case of the lead, it has a diameter of only a few inches, and that consequently each line of soundings, though miles in length, is only to be considered as representing a narrow width. 5

Surveys are not made on uniform scales, but each survey is made on a scale commensurate with its apparent importance. For instance, a general survey of a coast, which vessels only pass in proceeding from one place to another is not usually made on a scale larger than one inch to the nautical mile, while surveys of areas where vessels are likely to anchor, are made on a scale of three inches to the mile, and surveys of frequented ports or harbours likely to be used by fleets, on a scale of from six inches to ten inches to the nautical mile. 10 15

Close examination by sounding is the only method by which surveys on a large scale can be made, and in view of the vast mileage of surveys yet requiring completion in the interests of navigation, it would be a waste of time to undertake large scale coast surveys.

The scale on which a survey is to be conducted having been settled, it is manifestly superfluous to obtain more lines of soundings than can be represented on the paper. 100 soundings, which is the maximum number that can be placed with clearness on every square inch of paper, means that on a scale of one inch to the mile each sounding on the chart occupies an area representing eight acres of actual ground, whilst on a scale of six inches to the mile each sounding represents an area of a little less than a quarter of an acre, i.e., of 100 feet square. 20 25

The following diagram represents as many soundings as can be placed legibly on a square inch of paper:— 30

16	15	15	13	13	14	12	11	10	9
14	15	14	14	13	13	12	11	9	8
15	15	14	17	16	14	13	10	10	9
16	16	17	18	16	12	11	8	9	10
18	17	15	12	9	7	7	7	9	10
19	16	12	9	5	4	5	4	8	9
22	19	16	10	3	5	6	7	8	10
20	16	12	7	5	6	6	7	8	10
18	15	11	9	7	7	7	8	10	11
20	17	14	11	12	10	9	10	11	13

Little assistance in detecting excrescences on the bottom is afforded by the eye, when sounding in a boat, even in clear water, on account of the observer being within five feet of the surface; none in turbid seas. If, therefore, there is no inequality in the soundings to cause suspicion, a shoal patch between two lines may escape detection. 35

Thus, in a chart on a scale of one inch to the mile, an inequality of some acres in extent rising close to the surface, if it happened to be situated between two lines, might escape detection; whilst in a chart on a scale of 6 inches, inequalities as large as battleships, if lying parallel with, and between the lines of soundings, might exist without detection if they rose abruptly from an otherwise even bottom. 40

General coast charts should not, therefore, be looked upon as infallible, and a rocky shore should on no account be approached within the ten-fathom contour line, without taking every precaution to avoid a possible danger; and even with surveys of harbours on a scale of 6 inches to the mile vessels should avoid, if possible, 45

passing over charted inequalities in the ground, as some isolated rocks are so sharp that the lead may not find the highest part. Better results can, however, be obtained by sonic sounding owing to the rapidity with which such soundings can be taken, but even
5 this method will not find rocks unless the boat or vessel be directly over them.

Blank spaces among soundings mean that no soundings have been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water
10 is also deep ; but when they are shallow, or it can be seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion.

Soundings in hair line, which are shown on the latest charts in upright figures, and on other charts in sloping figures, indicate that
15 such soundings have been taken from smaller scale charts, an unreliable source, or adapted from old and imperfect surveys.

(2) **Fathom lines a caution.**—Except in plans of harbours that have been surveyed in detail, the six-fathom line on most Admiralty charts is to be considered as a caution or danger line against unnecessarily approaching the shore or bank within that line, on account of the
20 possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time
25 required for such a detailed survey. It is not contemplated that ships will approach the shore in such localities without taking special precautions.

The ten-fathom line is, on rocky shores, as before mentioned, another warning, especially for ships of deep draught.

30 Charts on which no fathom lines are marked must be especially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always
35 be avoided as there is no knowing how closely the spot may have been examined.

(3) **Chart on largest scale always to be used.**—It sometimes happens that from press of work, only the copper plate of the larger scale chart of a particular locality can at once receive any extensive
40 re-arrangement of coastline or sounding. This is an additional reason, besides the obvious one of the greater detail shown, why this largest scale chart should always be used for navigating.

(4) **Caution in using small-scale charts.**—In approaching the land or dangerous banks, regard must always be had to the scale of the
45 chart used. A small error in laying down a position means only yards on a large-scale chart, whereas on a small scale the same amount of displacement means large fractions of a mile.

For the same reason bearings to near objects should be used in preference to objects farther off, although the latter may be more
50 prominent, as a small error in bearing or in laying it down on the chart has a greater effect in misplacing the position the longer the line to be drawn.

(5) **Graduation.**—All plans are now being graduated in skeleton style before publication in order to facilitate easy reference to astro-
55 nomical positions ; previously published plans are also graduated as opportunity offers. The graduation is, however, of necessity often

based upon imperfect information of a conflicting nature; for this reason, whenever an astronomical position is quoted other than approximate (i.e., when seconds are given), it is necessary to quote also the number of the particular chart from which the position has been derived. 5

In this connection it is pointed out that, whenever possible, a position should be transferred from one chart to another by bearing and distance from a distinguishing feature common to both, such as a point of land or a light, &c., and not by the graduation which may differ owing to one of the charts being constructed on later and 10 more complete astronomical data than the other.

(6) **Distortion of printed charts.**—The paper on which charts are printed is, from various causes, subject to distortion, but the effect of this is seldom sufficient to affect navigation. It must not, however, be expected that accurate series of angles taken to different points will 15 always exactly agree when carefully plotted upon the chart, especially if the lines are to objects at some distance. The larger the chart the greater the amount of this distortion.

(7) **Buoys.**—It is manifestly impossible that any reliance can be placed on buoys always maintaining their exact position. Buoys 20 should, therefore, be regarded as warnings and not as infallible navigating marks, especially when in exposed positions; and a ship should always, when possible, be navigated by bearings of fixed objects on shore or angles between them, and not by buoys.

(8) **Light-buoys.**—The lights shown by light-buoys cannot be 25 implicitly relied on, as, if occulting or flashing, the apparatus may get out of order, or the light may be altogether extinguished. These lights in the British isles are from 5 to 217 candle-power.

(9) **Cable-buoys.**—Cable-buoys marking the ends of submarine cables usually are spherical or can-shaped, surmounted by a globe and 30 occasionally a flag. Below the topmark two *white fixed* lights, disposed horizontally, may be exhibited, but they cannot be implicitly relied on.

(10) **Lights.**—Arcs drawn on charts round a light are not intended to give information as to the distance at which it can be seen, but 35 solely to indicate, in the case of lights which do not show the same characteristics or colours in all directions, the bearings between which the differences occur.

All the distances given in the Admiralty List of Lights and on the charts for the visibility of lights are calculated for a height of an 40 observer's eye of 15 feet. The table of distances visible due to elevation, at the beginning of each volume of the Admiralty List of Lights, affords a means of ascertaining how much more or less the light is visible should the height of the eye be more or less. The glare of a powerful light is often seen far beyond the limit of visibility of the actual rays 45 of the light, but this must not be confounded with the true range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light at night, the fact is often forgotten that from aloft the range of vision is much increased. By noting a 50 star immediately over the light a very correct bearing may be afterwards obtained from the compass.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured 55 by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by remarking its candle

power, as given in the Admiralty List of Lights, and in some cases by noting how much its visibility in clear weather falls short of the range due to the elevation at which it is placed. Thus, a light standing 200 feet above the sea, and only recorded as visible at 10 miles in clear
 5 weather, is manifestly of little brilliancy, as its elevation would permit it to be seen over 20 miles, if of any power. (See table in the Admiralty List of Lights.)

The distance from a light cannot be estimated either by its brilliancy or its dimness.

10 On first making a light from the bridge, by at once lowering the eye several feet and noting whether the light is made to dip it may be determined whether the vessel is in the circle of visibility corresponding with the usual height of the eye or unexpectedly nearer the light.

(11) **Fog signals.**—Sound is conveyed in a very capricious way
 15 through the atmosphere. The following points in regard to fog signals should be borne in mind:—

(a) Fog signals are heard at greatly varying distances.

(b) Under certain conditions of atmosphere, when an air fog signal is a combination of high and low tones one of the notes may
 20 be inaudible.

(c) There are occasionally areas around a fog signal in which it is wholly inaudible.

(d) A fog may exist a short distance from a station and not be observable from it, so that the signal may not be sounded.

25 (e) Some fog signals cannot be started at a moment's notice after signs of fog have been observed.

Mariners are therefore warned that fog signals cannot be implicitly relied upon, and that *the practice of sounding should never be neglected*. Particular attention should be given to placing "Look-out men"
 30 in positions in which the noises in the ship are least likely to interfere with the hearing of the sound of an air fog signal; as experience shows that, though such a signal may not be heard from the deck or bridge when the engines are moving, it may be heard when the ship is stopped, or from a quiet position. It may sometimes be heard from aloft
 35 though not on deck.

Great assistance may be obtained from radio beacons at many important lighthouses and light-vessels, but the attention of Mariners is called to the serious dangers which may arise from their misuse. No attempt should be made to approach such a position on a radio
 40 bearing, whilst relying only on hearing the sound fog signal in sufficient time to alter course to avoid danger. When the radio fog signal is transmitted from a light-vessel, it is essential in order to avoid collision, that the bearing from the light-vessel should not be kept constant.

(12) **Tides.**—In navigating coastal waters where the range of the
 45 tide is considerable, caution is always necessary. The tidal predictions for Standard ports in the Admiralty Tide Tables can generally be relied upon to give the times of high and low water to within a few minutes, and heights within a few tenths of a foot. Larger errors are to be expected in the predictions for places which are not Standard ports,
 50 computed from the data in Part II, but such predictions computed from the harmonic constants are always sufficiently accurate for the general requirements of navigation. For Standard ports the heights of the tide at times between high and low water may usually be found within narrow limits in accordance with the instructions in Parts I
 55 and III of the Tide Tables.

The datums of Admiralty charts depending on Admiralty surveys

vary with the type of tide, but usually conform with the International agreement, that datum should be "a plane so low that the tide will but seldom fall below it." The datums used by different nations, however, differ very considerably and those of Admiralty charts depending on foreign surveys are always those used by the original surveyors, which vary from "lowest possible low water" to "mean low water" in tidal waters, and are usually mean sea level in non-tidal waters. 5

The datum used is always stated on large-scale Admiralty charts.

Caution.—Most datums are above the lowest level to which the tide may fall; the charts therefore do not always show minimum depths. 10

(13) **Tidal streams.**—Where the tidal streams are semi-diurnal information regarding them is usually given, in a convenient part of the chart, in tabular form or by notes, special symbols being inserted at the positions to which the information refers. In certain cases, where the information available is incomplete, the streams are indicated by means of arrows. 15

There are many places where the tidal streams cannot be predicted by reference to the tide at a Standard port. Although no data for predicting the times at which they flow is given, their general direction is, in many cases, indicated by arrows on the charts. For a few of the straits and channels, where these conditions exist, tidal stream predictions are given in Admiralty Tide Tables. 20

Tidal streams, particularly if rotary, may vary considerably both in direction and rate; predictions of the stream must therefore always be considered approximate. 25

The turn of the tidal stream is not usually coincident with the times of high and low water; in fact, though in estuaries, harbour entrances, &c., the stream usually turns at about the times of high and low water, in open channels, and along open coasts generally, the turn usually occurs more nearly at half-tide. Predictions of the times of high and low water must therefore never be used as predictions of the times of slack water. 30

It should be remembered that, even where the general direction of the stream is parallel with the shore, an indraught is usually experienced when crossing the entrances to bays and inlets. 35

(14) **Fixing positions.**—For further information on this subject, see Admiralty Manual of Navigation.

When in sight of land, every opportunity should be taken of fixing the ship's position by terrestrial objects. 40

(a) *Simultaneous bearings or angles.*—The most usual method is by compass bearings of suitable objects, and it must be borne in mind that a fix by only two bearings is liable to error, either an absolute error in taking the bearings, or those made in applying the deviation or in laying the bearings off on the chart. For these reasons, a third or check bearing of some other object should, when possible, be taken, especially when near the shore or dangers. The coincidence of the resulting three lines will prevent any mistakes if the objects are suitably placed. 45

The position may also be fixed by observing horizontal sextant angles of well-defined suitably placed objects. These angles may be plotted on the chart with a station-pointer. Two conditions are, however, necessary to its successful employment; first, that the objects be well chosen; and, second, that the observer is skilful and rapid in his use of the sextant and station-pointer. For the former, reference can be made to the pamphlet on the use of the station-pointer, 50

or to the Admiralty Manual of Navigation ; the latter is only to be obtained by practice.

It will readily be seen that a sextant often offers advantages, as angles can be obtained from any position whence the objects are visible, and the fix is in no way dependent on the compass.

In many narrow waters also, where the objects may yet be at some distance, as in coral harbours or narrow passages among mud banks, navigation by sextant and station-pointer is invaluable, as a true position can only be obtained by its means. A small error in either taking or plotting a bearing under such circumstances may put the ship ashore.

In all cases where great accuracy of position is required such as the fixing of a rock or shoal, or the addition to a chart of fresh soundings or new buildings, angles should invariably be used. In such cases angles should be taken of a number of objects, five being a good number, since this not only fixes the position beyond doubt, but also affords a useful check on the accuracy of the chart itself. When running a line of soundings it is only necessary to take a third angle every now and then, firstly to make certain that the more important soundings, as at the end of a line, are correctly placed, and secondly to check the general accuracy of the chart.

Sometimes when only one of the selected objects is visible from the compass, a compass bearing of it and a sextant angle to the other may be used to fix the position.

(b) *Simultaneous bearing and distance.*—Attention is also directed to the very useful and handy method of fixing by the bearing and distance of a suitable object.

Should the ship be supplied with ranging equipment, its use here is obvious, but without it a very good approximate distance of an object of known height may be obtained by observing its angle of elevation and obtaining its distance from Lecky's Offshore Distance Tables, which are supplied with all sets of charts. Full directions for the use of these Tables are given with them.

(c) *The running fix.*—If two position lines are obtained at different times the position of the ship may be found by transferring the first position line up to the time of taking the bearing for the second position line. The point of intersection of the second and the transferred position line is the ship's position at the time of the second observation.

The accuracy of this fix will depend on the accuracy of the estimated run (over the ground) between bearings and, therefore, it is essential to take great care that an accurate allowance is made for tidal stream, current, and leeway experienced by the ship during this interval.

The method of fixing by doubling the angle on the bow is useful when passing points of land, &c., in waters where there is either no tidal stream or current, or where this can be estimated with sufficient accuracy.

This method is as follows :—

Suppose that the angle between the ship's head and an object is measured, and found to X° , and that the time of the observation is noted. Suppose also that the time is again taken when the angle between the ship's head and the object is $2X^\circ$. Then, if the course made good is the course steered, the distance of the ship from the object at the time the second bearing was taken is equal to the run (over the ground) in the interval. Hence the ship's position can at once be laid off as a bearing and distance from the object. In practice the angle X should not be less than about 25° .

The most useful form of this method, the so-called " four-point "

bearing, gives a good fix for a departure, but does not ensure safety, as the point and any dangers that may lie off are abeam before the position is obtained.

The above fix is reliable when there is no tidal stream or current or when it runs directly with or against the course of the ship. When the stream or current runs across the course of the ship or when leeway is to be allowed for, this method should never be used and the ship's position should be obtained by plotting the two bearings as a running fix. 5

A table "Distance of an object by two bearings" is supplied with certain chart folios, and is also given in Inman's Tables, by which the ship's position at the second bearing can be found: any two bearings at a suitable angle to each other may be used, together with the run between them, but, again, this table should not be used when the vessel is subject to a cross tidal stream or leeway. 10 15

(d) *The danger angle.*—The use of the danger angle in passing out-lying dangers with land behind them should also not be forgotten.

A vertical danger angle is useful when the danger lies off an object such as a lighthouse, the height of which is known; the angle being obtained from the aforesaid Lecky's Tables. If a horizontal danger angle between two objects is used, however, caution is necessary, as, should the objects not be correctly placed on the chart, the angle taken from it may not serve the purpose. This method should not, therefore, be employed when the survey is old or manifestly im- 20 25

(e) *The astronomical position line.*—When fixing by astronomical observations, attention is drawn to the great utility of the position line. Even a single position line may at times give invaluable information, as the ship must be somewhere on this line, provided that the chronometer error is accurately known. 30

A sounding obtained at the same time may often serve to give an approximate position. Again, by steering along, or at a required distance parallel to, a single position line, a vessel may make her port or avoid a danger, although uncertain of her position.

A very accurate position may be obtained by observations of three or more stars at evening or morning twilight, or by the observation of a bright star at daybreak and another shortly afterwards of the sun when a few degrees (not less than 10°) above the horizon. The position lines obtained from the bodies observed should differ in azimuth by 30° or more. 40

Mariners are also reminded that, with modern tables for correcting the altitude, observations of the moon entail practically no more calculation than those of a planet. Moon sights are sometimes available when stars are obscured by light cloud, &c.; also, an excellent position may frequently be obtained by simultaneous observations of the sun and moon. 45

(f) *The radio position line.*—A number of radio systems of which the principal ones are M/F D/F, Radio Beacons, Consol Beacons, Loran, Gee and Decca, are now in general use from which position lines or fixes may be obtained. 50

The accuracy and range which may be obtained from these systems vary considerably; their great advantage over other methods lies in the fact that they can be employed under all weather and visibility conditions, though in some cases the results obtained will vary between day and night. 55

Special receiving equipment is generally required in order to make,

use of the radio signal, and some systems require special lattice charts or tables for plotting the position lines. Full details of these systems and their coverage areas are contained in Admiralty List of Radio Signals, Volume II.

5 The mariner should appreciate that with the position-fixing systems the accuracy of a fix will depend on three factors :—

- (i) The distance of the observer from the transmitters.
- (ii) The bearing of the observer from the base line joining the pair of stations which he is using.
- 10 (iii) The angle of intersection of the hyperbolic position lines.

It should be apparent from the inspection of any lattice chart that an inherent small equipment error, or a small personal error that may occur at the receiver, will cause a geographical error of varying amount according to the observer's position.

- 15 It is important to realize that accurate equipment is no guard against the vagaries of the propagation of radio waves. The beacons and systems operating on medium and low frequencies are liable to "night error" in areas where the ground and sky waves are received with equal strength; these areas will occur at ranges depending upon the
- 20 particular frequency used by any beacon or system. Where the transmissions of two stations are synchronised to provide one signal reading and position line, "night error" will be a minimum along the normal to the base line joining the pair of stations, and a maximum towards the limits of their service sector.

25 Little is yet known about the effects of hills and discontinuities in the terrain (such as cliffs) on the speed of medium- and low-frequency radio waves.

At the other end of the radio spectrum the transmissions of systems operating on the very high frequencies are subject to distortion in

30 abnormal atmospheric conditions.

- (g) *Fixing by radar*.—Radar may also be of considerable assistance when navigating in coastal waters in low visibility or at night. It is essential, however, to appreciate the limitations of a radar set when interpreting the information obtained from it. It must be remembered
- 35 that the radar horizon is only slightly farther than the visual horizon would be, in good visibility, for a height of eye equal to the height of the radar aerial. Hence no echoes will be received from a coastline lying below the radar horizon, while echoes may be received from high ground farther inland which will give a misleading impression of the
- 40 range of the nearest land.

Depending on the width of its beam, the bearings from a radar set tend to be inaccurate. It is therefore preferable when fixing by radar to use ranges rather than bearings. It is then most important to consider carefully the identity of the object giving the echo, using

- 45 the bearing as an indication, and the height of the object to determine whether it will appear on the radar presentation. Radar Range Nomograms are useful in deciding this, but a satisfactory result can be obtained by using "Distance to Sea Horizon Tables."
- When two or more objects on the radar presentation have been
- 50 selected and positively identified, a satisfactory fix can be obtained by striking arcs on the chart with the radar range of the selected objects. These arcs intercept at the ship's position. Best results will be obtained by using isolated objects such as detached lighthouses, rocky islets, and the extremities of long piers or jetties, but where no
- 55 such objects are available a steep coastline with cliffs should be used. Flat or gently shelving coastlines, such as mud flats or sand dunes,

should not be used since it is difficult to identify any portion of them on the radar presentation. Identification is assisted in some areas by fitting objects, such as buoys and beacons, with radar reflectors, causing them to return strong echoes. Attention is drawn to the symbols with which such objects are marked on Admiralty Charts, and which are given in the latest edition of Chart No. 5011, "Explanation of signs and abbreviations used on Admiralty Charts."

The difficulty of positive identification of objects is largely reduced if a Chart Comparison Unit is used in conjunction with the navigational radar. Fixes obtained with this equipment employ, in principle, an infinite number of ranges of the terrain in the vicinity of the ship, and in so doing a satisfactory fix will normally be assured.

In addition, radar beacons are available in some areas. Details of these and their use are given in the Admiralty List of Radio Signals, Volume II.

(15) **Observations for errors of the compass.**—No opportunity should be neglected for checking the error of the compass. When coasting, and a well-surveyed and fairly large scale chart is available, an excellent method of observing the error is by taking the compass bearing of two suitable objects when in transit, and comparing this with the charted bearing; there should be sufficient distance between the objects to provide a sensitive transit. When this method is not available the error should be obtained by azimuths of a heavenly body. Errors should be observed on any change of course on which the ship is steadied for a reasonable time, and at least twice a day when steering a steady course for long periods.

(16) **Change of variation of the compass.**—The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compasses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales, or when the lines are long, the displacement of position from neglect of this change may be of importance. The compasses are re-engraved when the error amounts to a degree, but the chart plates cannot be corrected more frequently from the impossibility of making alterations often on one spot in a copper plate.

The geographical change in the variation is in some parts of the world sufficiently rapid to need consideration. For instance, in approaching Halifax from Newfoundland the variation changes 10° in less than 500 miles, and in the English channel about 5° in 400 miles. The Variation chart should be consulted on this head.

On certain general charts embracing large areas with considerable change of variation, true compasses are placed instead of magnetic compasses, the variation being shown by *isogonic lines* (curves of equal magnetic variation), in a similar manner to the Variation chart. One or two *isogonic lines* are also sometimes placed on charts, in addition to the magnetic compasses, in order to indicate the general direction of these curves, and thus facilitate the determination of the variation to be employed in portions of the chart not in immediate proximity to any one of the engraved compasses. Magnetic variation values shown on Admiralty charts are for the 1st July of the year mentioned.

(17) **Local magnetic disturbance of the compass on board ship.**—The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in which it is placed. Observation shows that such disturbance of the

compass in a ship afloat is experienced only in a few places on the globe. Magnetic laws do not permit of the supposition that it is the visible land which causes such disturbance, because the effect of a magnetic force diminishes in such a rapid proportion as the distance from it increases that it would require a local centre of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetic ores in the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together. Such areas are depicted by a special symbol on charts, and the cause of the magnetic disturbance is referred to as a Local Magnetic Anomaly.

They may also be due to wrecks lying on the bottom in moderate depths, but investigations have proved that, while deflections of unpredictable amount may be expected when very close to such wrecks, it is unlikely that deflections in excess of 7° will be experienced, nor should the disturbance be felt beyond a distance of 250 yards.

It is very desirable that whenever a ship passes over an area of local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

(18) Use of oil for modifying the effect of breaking waves.—

Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows :—

1. On free waves, i.e., waves in deep water, the effect is greatest.
2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to, or in wearing.

6. No experiences are related of its use when hoisting a boat up in a sea-way at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

At anchor, when the sea is sufficient to render it difficult to hoist up or in boats, oil bags from forward or from the swinging booms have been found to render the sea alongside comparatively smooth.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

8. The best method of application in a ship at sea appears to be: hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.

The position of these bags should vary with the circumstances.

Running before the wind they should be hung on either bow and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the depth of the water.

11. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.

12. Towing a vessel in a heavy sea, oil is of the greatest service, and may prevent parting the hawser. Distribute from the towing vessel forward and on both sides; if used only aft the tow alone gets the benefit.

(19) **Mirage and abnormal refraction.**—An unusual lapse rate of temperature (and therefore density as well) with height immediately above the sea (or land) surface produces a distortion in the appearance of objects near the horizon; such a phenomenon is known as mirage.

When the surface is relatively cold (and the wind very light) so that the density of the air decreases rapidly for a short distance above the surface, light rays from objects low down near the horizon are bent down, the same way in fact as are usually the rays of the sun when entering the earth's atmosphere at a low altitude. The effect is to render visible objects that are normally below the horizon, e.g., lights may be "raised" at night at much greater distances than one would ordinarily expect. This phenomenon is known as "looming."

A further occasional effect produced when the air is appreciably warmer than the sea, is "superior mirage" in which an inverted image is seen over the real object; sometimes an erect image is seen immediately above and touching the inverted one. The object and its images in this instance are well defined in contrast to the shimmering object and image of the inferior mirage. Superior mirage is most often experienced in high latitudes and wherever the sea surface temperature is abnormally low.

"Inferior mirage," the effect of which is to decrease the distance at which objects are visible in a horizontal direction, is due to a rapid increase of density with height close to the surface such as occurs when air of comparatively low temperature blows over a warmer sea, or over a tarred road or desert when a hot sun is beating down on it. In either event light rays are bent up when approaching the surface where the density of the air is much less than above. The coastline, and at times a ship or island, may appear to be floating in air above a shimmering horizon, possibly with, in the former instance, her hull

either invisible or with an inverted image underneath. Inferior mirage is comparatively uncommon at sea and is more likely to be observed along a coastline than well out to sea.

When mirage is evident caution must be used in taking sights with
 5 a sextant, for abnormal refraction must necessarily be present also. With inferior mirage better, but not normal, results will usually be obtained by ascending as high as possible in the ship ; with superior mirage the height of eye should be as low as possible. It is, however, advisable, whenever abnormal refraction is suspected, to measure the
 10 elevation of the celestial body above the back as well as the front horizon as explained in navigational text-books.

(20) **Aurora.**—The most common form of aurora is an arc system, single or multiple, narrow and well defined, or broad and diffuse, and centred on the magnetic meridian.

15 The most usual colour is pale whitish green when the auroral activity is weak and diffuse : but when the aurora arises high towards the zenith in the form of rays, rayed curtains and draperies with much rapid movement of the constituent rays, the colours sometimes become much stronger and more vivid, and include bright green, red and violet.
 20 When the curtains forming the aurora converge to form a corona, which may rotate very rapidly about the point of convergence, the displays may become very complex, filling practically the whole sky, and extending far to the equatorial side of the zenith with much rapid movement and change of colour from instant to instant.
 25 Though the most usual duration of auroral displays in these high latitudes is several hours, they not infrequently last throughout the whole night from dusk to dawn. In such long displays the really intense and violently active periods with vivid strong colours are generally confined to spasms of 15–30 minutes, with the intervening
 30 periods filled with diffuse glows or quiet arc systems.

The absolute intensity of the light of the aurora is seldom great, and the brighter stars usually glimmer through it. In the most vivid and intense displays, the light may equal, but rarely surpasses, that of the full moon in a cloudless sky. It may give enough light to read
 35 by. On such occasions the aurora may be visible to some extent in partial twilight.

Though in high latitudes aurora occurs any time in the dark hours it is probably most frequent in the late evening hours from 9 p.m. till midnight or just after ; it is more frequent in the equinoctial months
 40 than at other times and has a well-defined 11-year period of activity following the cycle of solar activity. A maximum of activity occurred in 1948, and the interval from maximum to minimum activity usually occupies a period of about 6 to 7 years. In high latitudes this cycle of activity is reflected more in the intensity and vividness of the displays
 45 than in their frequency of occurrence. Though really outstanding displays tend to occur around the years of maximum activity they may occur at any time of the cycle, except perhaps near the absolute minimum.

In addition to this 11-year cycle of activity active periods tend to
 50 recur at intervals of 27 days, *see* Magnetic Storms.

Northern hemisphere.—Aurora Borealis occurs most frequently along a zone which forms an approximate oval, of average radius 23° , with centre in the extreme north-west of Greenland. This zone of maximum frequency crosses Hudson Bay and the Labrador coast in about lat.
 55 58° N. It runs south of Cape Farewell and along the south coast of Iceland. It lies just north of North Cape, touches the extreme north

of Novaya Zemlya, skirts Cape Chelyuskin and then eastward just north of Wrangel Island into the north of Alaska. Along this zone aurora of some kind can probably be seen every suitable night when the sky is clear; 250 miles outside this maximum zone to the southward the auroral frequency decreases sharply to about 70-100 nights a year on the average, and to 20-25 nights 500 miles south of the maximum zone. Inside the maximum zone the geographical distribution of frequency is not so well established but it probably falls off more gradually than it does outside. 5

On the zone of maximum frequency itself aurora appears as frequently to the south of the zenith as to the north, but with increasing distance outside the zone the appearances concentrate more into the northern sky; the reverse is true inside the zone.

Southern hemisphere.—The frequency and distribution of Aurora Australis is not fully known. It is probable that it is more frequently seen at sea between about long. 50° E. and 175° W. than in other longitudes. Very fine displays have occasionally been seen in Australasia and on passages across the Southern Ocean. There is nevertheless a general impression that aurora is less frequent in the southern than in the northern hemisphere. This is probably to be accounted for by the fact that, apart from whaling and exploring expeditions, ships' tracks in general do not extend to such high latitudes as in the northern hemisphere. 15 20

The zone of maximum auroral frequency is roughly annular and is near the circumference of a circle of radius about 1,080 miles, centred in about lat. 75° S., long. 129° E. The frequency falls off both outside and inside this zone. A large part of the zone is within the continent of Antarctica. 25

(21) **Magnetic storms.**—Magnetic storms vary in intensity and frequency with the sunspot cycle, similarly to aurorae. An intense magnetic storm is always accompanied by a bright and active aurora. The deeply coloured aurorae, showing more pronounced red and green, and sometimes also blue and violet, tints, are invariably connected with magnetic storms of considerable or great intensity. Such a storm will produce simultaneous aurora in both hemispheres. In the greatest storms aurorae in some form may be visible down to about 20° north latitude in certain parts of the oceans, especially between the meridians of 30° W. and 140° W. Magnetic storms vary greatly in duration from a few minutes to several days; they are generally more intense during the hours of darkness. Long-continued storms usually show great fluctuations with periods of complete or partial quiescence. Similarly the associated aurora fluctuates between active and quiescent forms. 35 40

The origin of magnetic storms and aurorae is not yet fully understood, but they are intimately connected with the state of a local area of the sun. As the same part of the sun is again presented to the earth after an interval of about 27 days, a magnetic storm and aurora may recur at this time, usually in less intense form. 45

A ship's compass may tend to deviate during the progress of a considerable magnetic storm. In more intense storms the compass needle may oscillate 1° or more either side of its normal position. Such oscillation may persist for as long as 10 or 20 minutes before dying out. Further oscillation may occur after a period of quiescence. Deviations of 2° or more are rare, but during the great magnetic storm and aurora of January 25th, 1938, one of 4° to the eastward was observed off the Portuguese coast. During a severe magnetic 50 55

storm the compass may be deflected continually in one direction to the extent of about half a degree for some hours. When bright aurora is seen, especially if it is of the more deeply coloured and rapidly moving kind, and particularly when it is observed in low latitudes, the possibility of deflections of the compass should always be borne in mind.

During a considerable magnetic storm freak wireless reception may occur on certain waves and short-wave transmission may fade to complete silence. Beam radio communication, especially in a west-east or east-west direction, may be interrupted. Such conditions may last in some degree over a period of several days, at times when the sun is unusually active. Short-wave fading also occurs occasionally from a different form of solar disturbance known as a "bright eruption," when this is very intense. On the average such fading begins about 7 minutes after occurrence of the bright eruption and may last 5 or 10 minutes, gradually returning to normal within a period of 40 to 45 minutes. These fadings are confined to the daylight hemisphere of the earth, while the magnetic storm fadings may occur by day or by night.

GENERAL METEOROLOGY.

(All the following articles do not apply to every Pilot, but articles applicable to this Pilot will be referred to in the Climate and Weather Section in Chapter I.)

- (1) **Lows.**—A low, or depression, appears on a synoptic chart as a series of isobars roughly circular or oval in shape, surrounding an area of low pressure. It is a main feature of the weather at sea in middle latitudes where it is responsible for most of the occasions of strong winds and unsettled weather, though not all depressions are accompanied by strong winds.
- Lows vary very much in size and depth; one may be only a hundred miles in diameter and another over two thousand miles; some are deeper than others, a deep low being one in which the pressure is very much lower near the centre than on the outside whereas, on the other hand, a shallow depression is one where the pressure, although low near the centre, is not very much lower than in the surrounding districts.

Note.—The bracketed equivalents hereunder refer to the Southern Hemisphere.

- In the northern (southern) hemisphere the winds blow round an area of low pressure in an anti-clockwise (clockwise) direction; there is also a slight inclination across the isobars towards the lower pressure. Thus the well-known rule for the northern (southern) hemisphere is that when an observer faces the wind the direction of the lowest pressure is from 8 to 12 points to his right (left). The strength of the wind is in all instances closely related to the steepness of the barometric gradient or distance apart of the isobars; the closer the isobars the stronger the wind.

Lows may move in almost any direction, though most often towards north-east (south-east) or east, at a speed of anything between 10 and 40 knots, though occasionally as much as 60, during the middle and most active stage of their existence; they slow down when filling up (see "occlusion" below). The life of a low is in the region of 4 to 6 days.

There are usually one or more fronts, probably radiating from the centre, in the area covered by a low ; each front on a synoptic chart represents a belt of relatively bad weather, accompanied by a veer (backing) of wind, which marks the change from the weather characteristic of one air mass to that of another. During the first two or three 5 days of its life a low has a warm and a cold front, the area between the two being known as a warm sector because the air has come from a warmer locality than that which is outside the sector (*see* Fig. 1*a*). Warm air is lighter than cold air and it rises over the cold air ahead of the warm front as shown in Fig. 1*b* ; this causes condensation of the 10 water vapour in the warm air, forming at first cloud and later drizzle or continuous steady rain. The cloud spreads out ahead of the warm front, and the highest cloud, cirrus or mares' tails, is often about 500 miles ahead. At the rear boundary of the warm sector, known as the "cold front," the cold air is pushing under the warm air forcing 15 the latter to ascend rapidly ; this process is sometimes violent enough to produce squalls. The rapid ascent of the warm air causes the moisture to condense in the form of cumulo-nimbus clouds (shower clouds), from which heavy showers may fall. The cold front gradually overtakes the warm front so that the warm sector is eventually lifted 20 up from the earth's surface. When this has occurred the low is said to be occluded, and the warm and cold fronts have merged into the third type of front known as an "occlusion" (*see* Figs. 2*a* and *b*). When a low has become occluded, it usually decreases in intensity and rate of travel, and gradually fills up. On the other hand, a low 25 which has a marked warm sector is likely to be deepening, the winds associated with it may increase in force and its rate of travel may increase. Lows are usually travelling in a direction approximately parallel to the isobars (and in the direction of the wind) in the warm sector. 30

The approach of a low is indicated by a falling barometer. In the northern (southern) hemisphere, if the low is approaching from westward and passing northward (southward) of the ship, clouds appear on the western horizon, the wind shifts to a south-westerly (north westerly) or southerly (northerly) direction and freshens, the cloud 35 layer gradually lowers, and finally drizzle, rain or snow begins. If the low is not occluded, after a period of continuous rain or snow there is a veer (backing) of wind at the warm front, a rise of temperature and diminution or cessation of rain (or snow) in the warm sector, the visibility being usually moderate and the sky overcast with low cloud. 40 The passage of the cold front is marked by the approach from westward of a thick bank of cloud (which however cannot often be seen because of the customary low overcast sky in the warm sector), a further veer (backing) of wind to west or north-west (south-west), sometimes with a sudden squall, rising pressure, a fall of temperature, squally showers 45 of rain, hail or snow, and improved visibility (except during showers). The squally showery weather with a further veer (backing) of wind and drop in temperature may recur while the low recedes owing to the passage of another cold front or occlusion. If the low is occluded, the occlusion is preceded by the cloud of the warm front ; there may 50 be a period of continuous rain mainly in front of and at the line of occlusion, or a shorter period of heavy rain mainly behind the occlusion, according as the air in front of the occlusion is colder or warmer than that behind it. There may be a sudden veer (backing) of wind at the occlusion. 55

Often another low follows 12 to 24 hours later, in which event the

barometer begins to fall again and the wind backs towards south-west (north-west), or even south (north).

If a low travelling eastward or north-eastward (south-eastward) is passing southward (northward) of the ship, the winds in front of it
5 are easterly and they back (veer) through north-east (south-east) to north (south) or north-west (south-west); changes of direction are not likely to be so sudden as on the southern (northern) side of the low. In the rain area there is often a long period of continuous rain and unpleasant thick weather with low cloud. In winter in the colder
10 regions the weather is cold and raw and precipitation is often in the form of snow.

Near the region of lowest pressure, lulls are sometimes experienced, but sudden changes are likely, and in a deep low the wind may increase in strength very rapidly, perhaps to gale force as the barometer begins
15 to rise.

Sometimes in the air circulation of a large low, usually on the equatorial side and often on a cold front, a secondary depression develops, travelling in the same direction as the primary but usually more rapidly. The secondary often deepens while the original low
20 decreases in intensity. In the region between the primary and the secondary depressions, the winds are not as a rule strong; but on the further side of the secondary, usually the southern (northern) side, winds are likely to be strong and they may reach gale force. Thus the development of a secondary may cause gales at a greater distance
25 from the primary than anticipated, while there may be only light winds where gales were expected.

The above is a brief general description of lows and the associated weather in temperate or middle latitudes of the northern (southern) hemisphere. It must be emphasised, however, that individual lows
30 in different localities differ considerably from one another, according to the characteristics (especially the temperature and humidity) of the air currents of which they are composed, and the nature of the surface over which they are travelling.

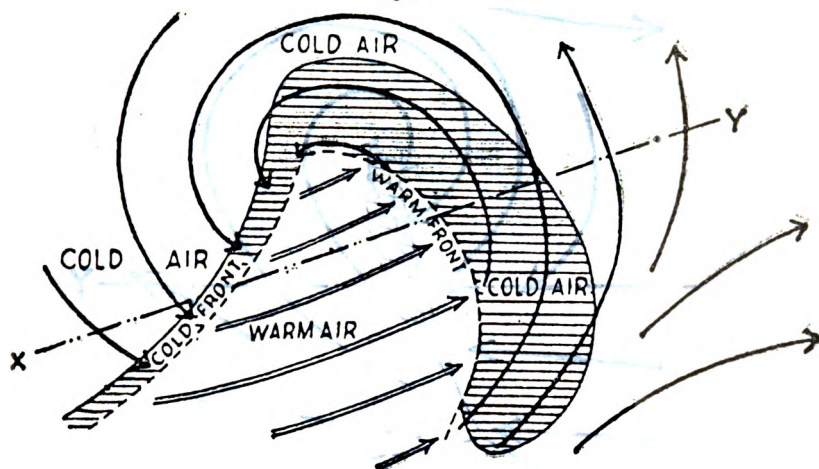
(2) **Tropical revolving storms.**—*Practical rules for avoiding*
35 *them.*—These storms are so named because the wind blows round an area in which the lowest pressure is at the centre. The direction of rotation is anti-clockwise in the northern hemisphere and clockwise in the southern hemisphere. The wind does not revolve round the centre of low pressure in concentric circles but has a spiral movement inwards,
40 towards the centre of the storm field.

A tropical storm is not so extensive as the depression of higher latitudes but, within 75 miles or so of the centre, the wind is often far more violent, and the high and confused seas near the centre may cause considerable damage to large and well-found ships, while small vessels
45 (for example, destroyers) have foundered. The danger is still greater when ships are caught in restricted waters without adequate room to manœuvre. Within 5 to 10 miles of the centre the wind is light or moderate and variable, the sky is clear or partially so, and there is a heavy, sometimes mountainous, confused swell; this area is known as
50 the "eye" of the storm. After passing through the relatively windless centre of the storm the wind will suddenly, and with great violence, commence to blow from a direction almost opposite to that experienced on the other side of the windless centre. Due to torrential rain and sheets of almost continuous spray, visibility near the storm centre
55 (but outside the "eye") is almost nil.

Every ship navigating in an area subject to tropical storms during

NORTHERN HEMISPHERE.

Fig. 1a.



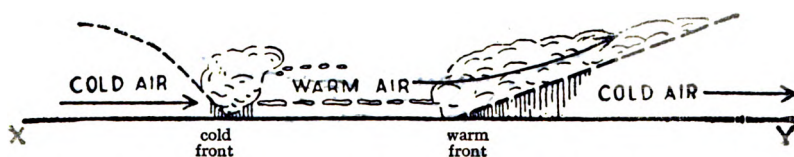
Plan of a developed depression.

The double lines show the flow of the warm air, and the single lines the flow of the cold air.

The shading shows the areas where rain (or snow) is most probable.

Width of rain belt ahead of warm front is generally between 100 and 200 miles.

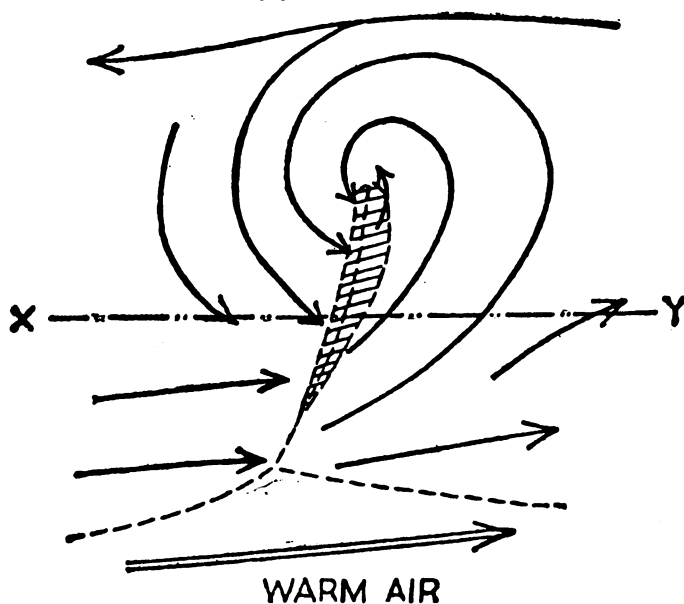
Fig. 1b.



Vertical section of the depression along the line XY.

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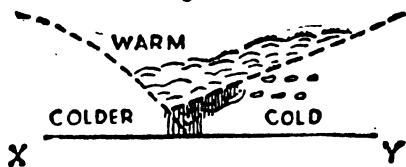
Fig. 2a.
COLD AIR



WARM AIR
Plan of an occluded depression.

The shading shows the region where rain (or snow) may be expected near the occlusion.

Fig. 2b.

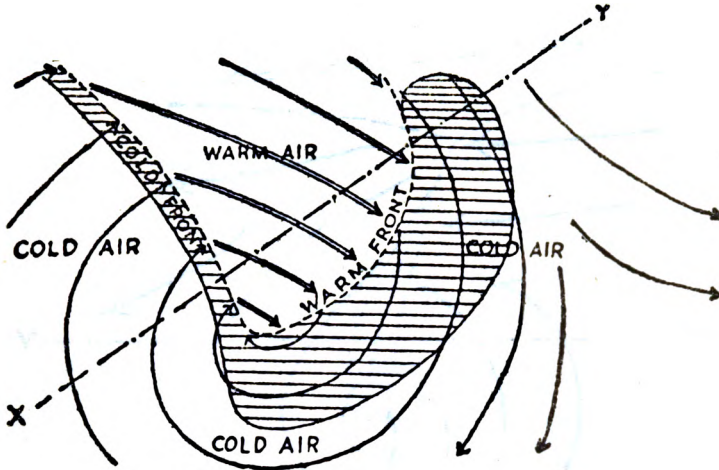


Vertical section of an occlusion of the cold front type.

The air in front of the occlusion is warmer than the air behind it.

SOUTHERN HEMISPHERE.

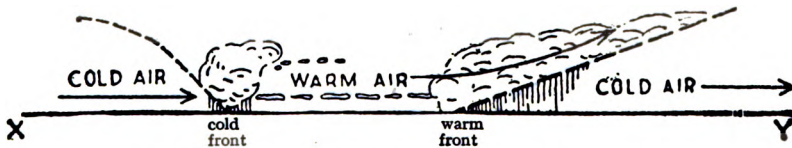
Fig. 1a.



Plan of a developed depression.

The double lines show the flow of the warm air, and the single lines the flow of the cold air.
 The shading shows the area where rain (or snow) is most probable.
 Width of rain belt ahead of warm front is generally between 100 and 200 miles.

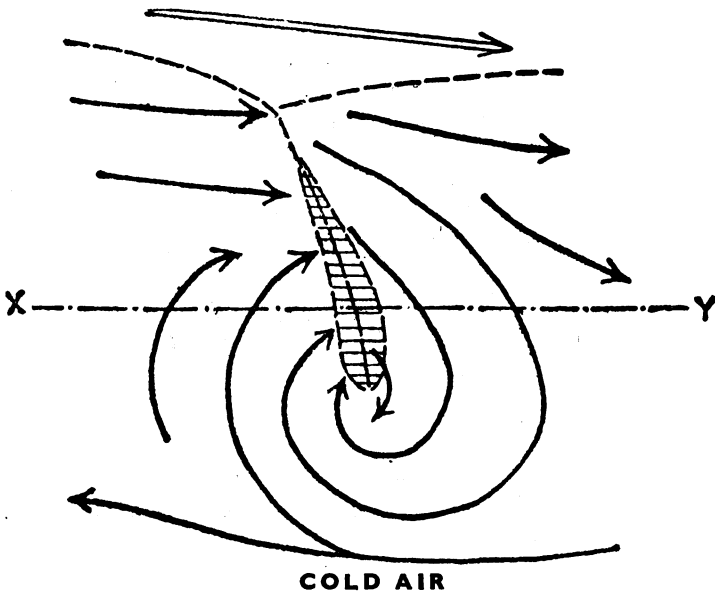
Fig. 1b.



Vertical section of the depression along the line XY.

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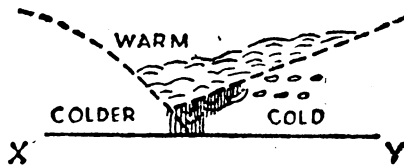
Fig. 2a.
WARM AIR



Plan of an occluded depression.

The shading shows where rain (or snow) may be expected near the occlusion.

Fig. 2b



Vertical section of an occlusion of the cold front type.

The air in front of the occlusion is warmer than the air behind it,

the season of their occurrence should be constantly on the alert for any sign of their approach, so that steps can be taken to avoid the danger zone while there is still time and sea-room.

Localities, season, and average frequency.—Tropical storms occur for the most part on the western side of the oceans, though they are also experienced in the Bay of Bengal, off the north-west coast of Australia, and off the west coast of Central America. They are unknown in the South Atlantic. They are given various names according to the part of the World in which they occur. 5

Western North Atlantic	}	hurricanes	10
Eastern North Pacific			
South Pacific			
Western North Pacific	}	-typhoons	
Indian Ocean			
Bay of Bengal	}	-cyclones	15
Arabian Sea			
North-west Australia			
		-willy-willies	

They are most frequent during the late summer and early autumn of their hemisphere; they are comparatively rare in the southern hemisphere from mid-May to November, and in the northern hemisphere from mid-November to mid-June. In the Arabian Sea, however, storms are most likely to occur at the change of the monsoon, i.e., October–November, and May–June, though they average only one or two a year. Out-of-season storms occur from time to time, particularly in the western North Pacific where no month is entirely safe, and in the Indian Ocean where one is reported south of the Equator perhaps once in two years outside the usual season. The following table shows approximately the average number of severe tropical storms recorded per annum, from statistics taken over several years for the various areas:— 20 25 30

West Indies	5	35
Western North Pacific	25	
„ South Pacific	3	
Southern Indian Ocean	6	
Bay of Bengal	2	
Arabian Sea	1	
Eastern North Pacific	3	
West Coast of Australia	1	

Variations in any one year amounting to 50% above or below the average are not unusual. Some of the figures quoted are probably an underestimate since in the less-frequented parts of the world many storms must escape detection. 40

Origin, movement and extent.—Tropical storms originate as a general rule in the doldrums, between the parallels of 7° and 15° of latitude; those which affect the western part of the Pacific, South Indian and North Atlantic Oceans are first reported in the western third of those oceans, though there are exceptions such as in the North Atlantic during August and September where an occasional storm is known to begin near the Cape Verde islands. In the northern hemisphere they move off in a direction between 275° and 350°, though most often within 30° of due west. When in a latitude of 25° or so they usually recurve away from the equator and, by the time they have reached the 30th parallel, the track (or path as it is more usually called) is north-easterly. In the southern hemisphere they move off in a WSW. 45 50

to SSW. direction (usually the former), recurve at about 15° to 20° S., and thereafter adopt a south-easterly path. In either hemisphere many storms do not recurve but continue in a west-north-westerly (or west-south-westerly) direction until they reach the mainland where they quickly die.

The speed of advance of these storms is usually about 10 knots in their early stages, increasing a little with latitude; it seldom exceeds 15 knots before recurving, but after recurving 20 to 25 knots is usual though speeds of 40 knots or even more have been known.

Occasionally storms move erratically, the path turning towards the equator, or adopting an easterly component in a low latitude, or even making a complete loop, but on these occasions their speed of advance is low, usually less than 10 knots, while the unusual path is being followed.

The extent of the storm area varies considerably with individual storms but, generally speaking, winds of force 7 or more are improbable at more than 200 miles (especially on the equatorial side of the storm area) and force 8 is unlikely to be exceeded at more than 100 miles, from the storm centre, if in a latitude of less than 20° . Thereafter the radius increases with latitude so that these distances are nearly doubled on reaching the 35th parallel, but the intensity diminishes near the centre. Hurricane force winds are likely within 75 miles of the storm centre in the tropics, and gusts exceeding 150 knots have been reported in a few instances within 50 miles or so (except in the eye of the storm). The aim of the mariner should therefore be to remain as far as possible from the centre of the storm system.

Warning of existence or approach.—In most instances, warning of the position, intensity and probable movement of a storm is given by radio at frequent intervals by meteorological authorities ashore. (See Admiralty List of Radio Signals, Volume III.) Sometimes, however, there is insufficient evidence available for an accurate warning or even a general warning to be given and ships must then be guided by their own observations. Of the following indications of the proximity of a tropical storm, the first is by far the most reliable within 20° or so of the equator; it should be borne in mind, however, that very little warning may be expected of the approach of an intense storm of unusually small diameter.

(a) If the corrected barometer reading is 3 mb. or more below the mean for the time of year, as shown in a climatic atlas or on the appropriate chartlets in the meteorological text of this Pilot, suspicion should be aroused and action taken to meet any development, such as raising steam in any available additional boilers, &c. It should be noted, however, that the barometer reading must be corrected not only for height, latitude, temperature and index error (if mercurial), or for height and index error if aneroid, but also for diurnal variation, the amount of which is given for each hour of the day in the Air Ministry climatic atlases and in the meteorological text of this Pilot. If the reading thus corrected is 5 mb. or more below normal, it is time to take avoiding action for there can be little doubt that a tropical storm is in the vicinity. According to an analysis of observations in the Western Pacific the centre of the storm is then probably not more than 200 miles away. At this distance, at any rate in the China Sea vicinity, the wind has usually increased to about force 6.

When proceeding through an area liable to be visited by these storms it is desirable to take hourly readings of the barometer.

(b) An appreciable change in the direction and/or strength of the wind.

(c) A swell is sometimes evident, proceeding from a direction that approximates to the bearing of the centre. If ahead of the storm this indication may be apparent before the barometer begins to fall. 5

(d) Extensive cirrus cloud followed, as the storm becomes closer, by much alto-stratus cloud and subsequently fracto-cumulus or "scud."

(e) In addition there is the warning that can be given by Radar. The existence of moderate or heavy rain can usually, under favourable meteorological conditions, be detected at the extreme range of centrimetric radar, such as is normally used for navigational purposes afloat, depending on the vertical extent of the rainfall. Subrefraction might decrease and superrefraction increase this range as with any other target. Although moderate or heavy rain does not fall symmetrically all round a storm, it is continuous for at least 50 miles in a broad sector extending from the "eye" of the storm where there is a circular area of relatively light winds and clear or partially clear sky. By the time radar evidence of the exact position of the storm is available, the ship will probably be already in fairly high seas and experiencing winds of force 9 or 10. There should still be time, however, for her to avoid the centre of the storm. 10 15 20

Note.—In accordance with Article 35 of the International Convention for Safety of Life at sea it is the duty of every ship who suspects the presence or formation of a tropical revolving storm immediately to inform other vessels and shore authorities with all the means at her disposal. Weather reports should be made by radio at frequent intervals giving as much information as possible, especially corrected (not for diurnal variation as in (a) above) barometer readings. If barometer readings are uncorrected this fact should be stated in the signal. 25 30

Information required by the seaman before deciding upon action to be taken.—To decide on the best course of action if a storm is suspected to be in the vicinity, the mariner requires to know:—

- (a) the bearing of the centre of the storm; 35
- (b) the semicircle in which the ship is situated;
- (c) the path of the storm.

If an observer faces the wind, the centre of the storm will be from 9 to 11 points on his right-hand side in the northern hemisphere when the storm is about 200 miles away, i.e., when the barometer has fallen about 5 millibars and the wind has increased to force 6 or thereabouts; as a rule the nearer one is to the centre the more nearly does the angular displacement of the wind approach 8 points. A further check on the bearing of the centre may often be obtained by noting the direction from which the swell is coming. The swell travels approximately directly outward from the storm centre. 40 45

The semicircle in which the ship is situated can be determined by taking two such bearings with an interval of from two to three hours between observations, provided that allowance is made for the ship's movement. It can be assumed that the storm is not travelling towards the equator; and, if in a lower latitude than 20°, its path is most unlikely to have an easterly component; and, on the rare occasions when neither of these statements applies, the storm is moving very slowly. (Exceptions to this are most likely in the South Pacific, where occasional storms often move off on a course almost due south developing an easterly component at a latitude of about 15°, and in the western 55

North Pacific where some of the out-of-season storms may recurve at an early stage.)

In a moving ship associated with a storm progressing at an unknown rate, it is very difficult to estimate from an apparent shift of wind the direction and speed of the storm's motion relative to the ship. The surest method of ascertaining the true shift of wind and thereby finding out in which semicircle the vessel is situated, *is to stop the ship during the period between the two bearings*. If in either hemisphere, these observations show that the wind is veering, the ship is in the right-hand semicircle; if the wind is backing she is in the left-hand semicircle; and if the wind remains steady in direction then the vessel is in the direct path of the storm, which is the most dangerous place of all.

The diagram headed "Typical Paths of Tropical Storms" (at the end of this article) illustrates the terms "dangerous semicircle" and "navigable semicircle." The former lies on the side of the path towards the usual direction of recurvature, i.e., the right-hand semicircle in the northern and the left-hand semicircle in the southern hemisphere. It is so called because a sailing or low-powered vessel caught in it may be blown towards the path along which the storm will pass, or the storm may recurve and the centre pass over her. The navigable semicircle is that which lies on the other side of the path. A ship situated within this semicircle will tend to be blown away from the storm centre, and the recurvature of the storm will increase her distance from the centre.

Practical rules for avoiding tropical storms.—In whatever situation a ship may find herself, the matter of vital importance is to avoid passing within 50 miles or so of the centre of the storm; it is preferable to keep outside a radius of 200 miles or more, because at this distance the wind does not often exceed force 7 (and is generally not more than force 6), and freedom of manœuvre is maintained. If a ship has at least 20 knots at her disposal, and shapes a course that will take her most rapidly away from the storm before the wind has increased above the point at which her movement becomes restricted, it is seldom that she will come to any harm.

Sometimes a tropical storm moves so slowly that a vessel, if ahead of it, can easily outpace it or, if astern of it, can overtake it. Since, however, she is unlikely to feel seriously the effects of a storm so long as the barometer does not fall more than 5 mb. (corrected for diurnal variation) below the normal, it is recommended that frequent readings should be made if the presence of a storm in the vicinity is suspected or known, and that the vessel should continue on her course until the barometer has fallen 5 mb., or the wind has increased to force 6 when the barometer has fallen at least 3 mb. If and when either of these events occurs, she should act as recommended in the following paragraphs, until the barometer has risen above the limit just given, and the wind has decreased below force 6. Should it be certain, however, that the vessel is behind the storm, or in the navigable semicircle, it will evidently be sufficient to alter course away from the centre.

In the northern hemisphere.—(a) If the wind is veering, the ship must be in the dangerous semicircle. A steam or other power-driven vessel should proceed with all available speed with the wind 1 to 4 points (depending upon her speed) on the starboard bow, and should subsequently haul round to starboard as the wind veers, thereby tracing a course relative to the storm as shown by the pecked line in the diagram. If a steamer has insufficient room to make much headway when in the dangerous semicircle she should heave to in the

most comfortable position relative to the wind, preferably with the wind on her starboard bow so that she is heading away from the centre of the storm.

(b) If the wind remains steady in direction, or if it backs, so that the ship seems to be nearly in the path (it is sometimes difficult to determine satisfactorily if indeed the ship is nearly in the path, particularly if in the dangerous semicircle, because the wind does not always behave according to rule) or in the navigable semicircle respectively, a steam vessel should bring the wind well on the starboard quarter and proceed with all available speed, subsequently altering course to port as the wind backs, thus tracing a course relative to the storm as shown by the pecked line in the diagram. 5 10

In the southern hemisphere.—(a) If the wind is backing, the ship must be in the dangerous semicircle. A steam or other power-driven vessel should proceed with all available speed with the wind 1 to 4 points (depending upon her speed) on the port bow, and should subsequently haul round to port as the wind backs, thereby tracing a course relative to the storm, as shown by the pecked line in the diagram. If a steamer has insufficient room to make such headway she should heave-to in the most comfortable position relative to the wind, preferably with the wind on her port bow so that she is heading away from the centre of the storm. 15 20

(b) If the wind remains steady in direction, or if it veers, so that the ship seems to be nearly in the path (it is sometimes difficult to determine satisfactorily if indeed the ship is nearly in the path, particularly if in the dangerous semicircle, because the wind does not always behave according to rule) or in the navigable semicircle respectively, a steam vessel should bring the wind well on the port quarter and proceed with all available speed, subsequently altering course to starboard as the wind veers, thus tracing a course relative to the storm as shown by the pecked line in the diagram. 25 30

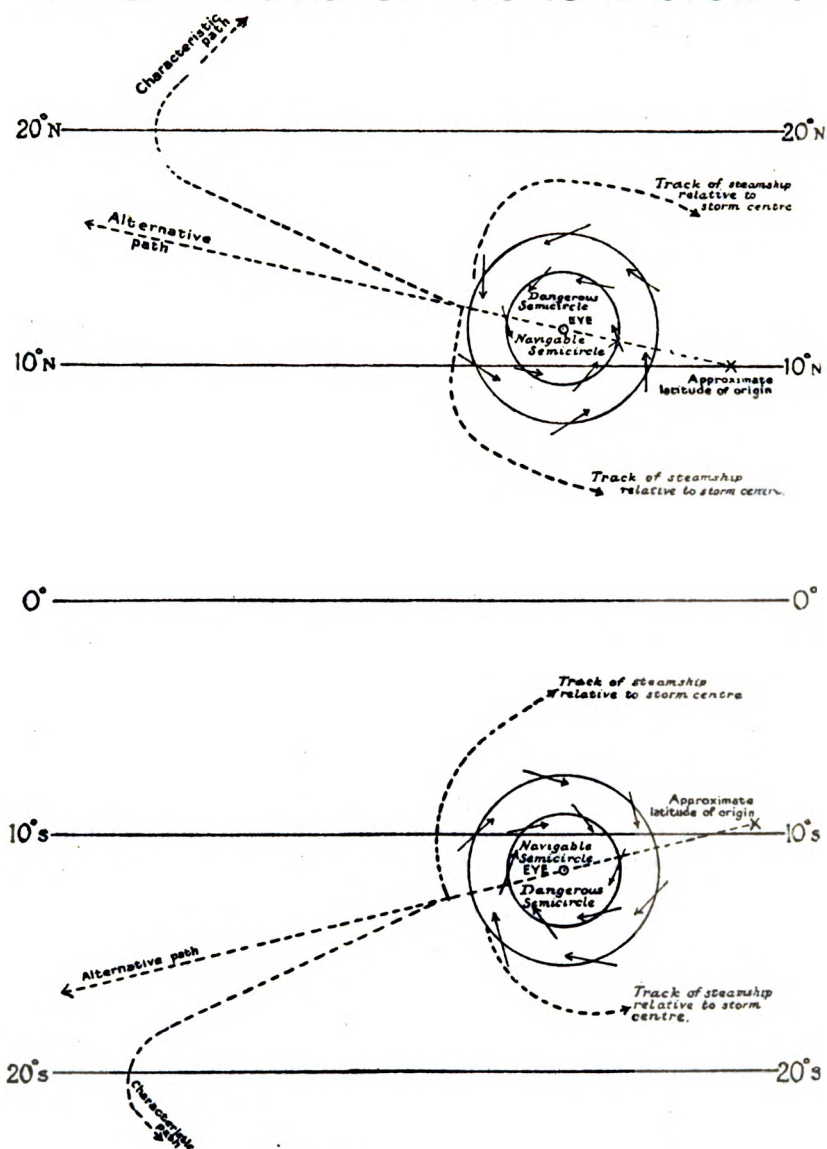
If there is insufficient room to run when in the navigable semicircle, and it is not practicable to seek a safe and effective shelter before the storm begins to be felt, a vessel should heave-to in the most comfortable position relative to the wind and sea, bearing in mind the proximity of land. 35

If a ship finds that she is in the direct path of the storm and has no room to run into the navigable semicircle as directed above, it should be considered, bearing in mind possible recurvature, whether she should endeavour to make her way into the "dangerous" semicircle (where she may at least be better off than remaining in the direct path of the storm) and continue to steam to windward as fast as she can so as to get as far as possible from the centre. 40

If in harbour, or at anchor, a seaman should be just as careful as at sea in watching the shifting of the wind and estimating the movement of the storm relative to himself, so that he may consider shifting his berth with advantage or otherwise act according to circumstances. It is usually preferable, however, to put to sea if this can be done in sufficient time to avoid the worst of the storm. Riding out a tropical storm, the centre of which passes within 50 miles or so, in a harbour or anchorage, even if some shelter is offered, is an extremely unpleasant and hazardous experience, especially if there are other ships in company. Even if berthed alongside, or with special moorings and long bridles in use, a ship cannot feel entirely secure. 45 50

Discretion must, of course, be used. In the case of a low-powered or small vessel with, for example, insufficient warning to enable her to 55

TYPICAL PATHS OF TROPICAL STORMS



Note.—In this diagram the isobars are shown as concentric circles about the eye; in practice this is usually the case within 150 miles or so of the centre. Outside this distance the isobaric form often loses its symmetry and strong winds often extend farther on the polar side than on the equatorial.

gain sufficient distance from the storm by putting out to sea, it will be preferable to remain in a reasonably sheltered harbour. If at sea and warning of an approaching storm is given and there is considered to be insufficient time or sea room to avoid the dangerous part of the storm area, it may be advisable for vessels of this type to seek shelter. 5 In the China Sea, for example, there are so-called typhoon harbours which are listed in the Admiralty Pilot. In all cases, however, the mariner must use seamanship and initiative.

(3) **Local modification of the weather near the coast.** The information given in Chapter I on climate and weather in the area 10 covered by the Pilot refers necessarily to the coastal and sea regions generally but cannot attempt to deal with the local effects on the wind and weather of each separate headland, bay, or creek. The following notes, however, should prove helpful in showing how the weather in the general vicinity is likely to be modified by the topog- 15 raphy or shape of the land close to the actual place in which the mariner is concerned.

- (i) If the coastline is steep-to, onshore winds that approach it at an angle are usually deflected nearly along the shore and increased somewhat in speed. And when the wind approaches 20 a strait whose direction is somewhat similar to that of the wind, the wind tends to blow along the strait and increases in speed as the strait narrows.

When a strong wind blows directly towards a very steep coast, there is usually a narrow belt of contrary gusty winds 25 close to the coast.

- (ii) Similarly when the wind blows onshore towards the entrance to a wide estuary, especially one with hills on both sides, it generally tends to blow up the estuary. This effect is most marked in the afternoon but there is often no such tendency 30 during the night and early morning.
- (iii) An offshore wind is often squally on the lee side of hilly coasts, especially when the air is much colder than the sea, as for example when it blows off snow-covered land and when the wind over the open sea is force 5 or more. 35
- (iv) Near headlands or islands with steep cliffs there may be large changes in direction (up to about 90°) and speed of the wind in addition to those mentioned above.
- (v) During quiet and warm weather with clear or fairly clear 40 skies, a sea breeze is of common occurrence during the warmer part of the day ; it is especially frequent in the tropics and sub-tropics. It blows onshore from, on the average, 4 to 8 hours after sunrise until shortly before sunset, reaching its maximum development during the afternoon (1300 to 1600) ; if there is an appreciable regional or general wind, then this will be modified 45 by the onshore sea breeze. Under particularly favourable circumstances such as high dry temperatures, relatively cool sea, and hilly background to coast, the sea breeze may blow as much as force 4 (occasionally 5) and extend 20 miles or more to seaward from the shore. At night under similar 50 circumstances a lighter breeze blows from the land to the sea ; it seldom extends more than 5 miles from the shore nor does it become appreciable much before 2200 local time ; under favourable conditions, as in the tropics, it usually lasts until an hour or so after sunrise. 55
- (vi) When sea fog that is caused by the passage of warm air over a

colder sea surface is general over the open sea, visibility is better close to leeward of a hilly island or promontory than to windward. This effect is most marked in late spring and summer, during the early afternoon when the land is at its warmest, and then applies to low lying land as well.

- (vii) Radiation fog which forms over land on quiet nights with clear skies, mainly in autumn and winter, and sometimes spreads a few miles out to sea, is least thick during the afternoon and is often worst during the first hour or two after sunrise.

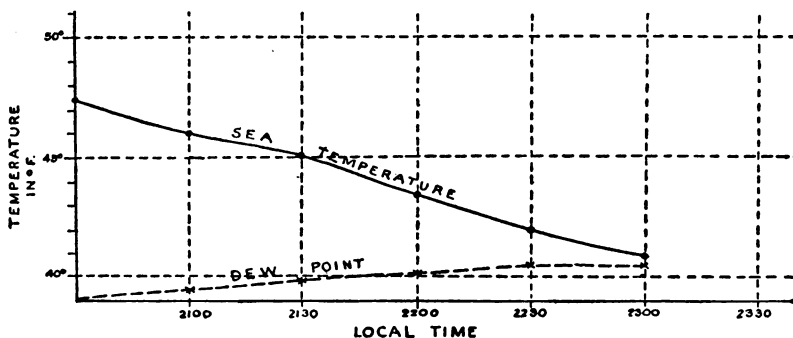
(4) **Forecasting sea fog.**—The most frequent type of fog in the open sea is that caused by relatively warm air flowing over a colder sea. Warning of this type of fog may be obtained by frequent observations of air and sea surface temperatures; if the sea temperature falls below the dewpoint of the air, fog is almost a certainty. The following procedure is recommended whenever the temperature of the air is higher than, or about equal to, that of the sea, especially at night when approaching fog cannot be seen until shortly before entering it.

Sea and air (both dry and wet bulb) temperatures should be observed at intervals of about 5 miles and the sea temperature plotted against dewpoint. The dewpoint is obtainable from tables published in various text-books, but at temperatures up to about 60° F. a close enough approximation may be obtained by assuming it to be the same amount below the wet-bulb temperature as the latter is below the dry-bulb temperature; for example, if the dry bulb reads 50° F. and the wet bulb 48°, the dewpoint is about 46°. If the curves of sea temperature and dewpoint converge, fog may be expected by the time at which they coincide.

The figure below represents conditions that might be found by a low-powered ship in about long. 40° W. proceeding westward on the appropriate lane route for Halifax, Nova Scotia. At 2200 it would become evident that there is a probability of running into fog in about an hour's time, assuming that the sea temperature continues to fall at about the same rate that it has done during the last 1½ hours.

From the appropriate chart of average sea surface temperatures it can be seen where a rapid fall of temperature may be expected, so that if the dewpoint is within 5° or so of the sea temperature when approaching the colder water zone, this will also give a fairly reliable warning of fog.

If it is desirable and practicable to escape from fog, a ship should steer for warmer water which will again be evident from the charted isotherms.



Fog, or very poor visibility, at sea may also occur in snow or heavy rain, or in association with the passage of a warm front or occlusion, or, when within 20 miles or so of land, it may occur as a result of radiation fog extending from the land; in high latitudes in winter, sea smoke may be met near land, when very cold offshore winds are blowing, or near extensive ice. The method described above will not give warning of these fogs, of which frontal fogs, though common in middle latitudes, are neither so extensive nor so persistent in any one locality, and the other fogs mentioned are rarely encountered far from land (or extensive ice).

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IMPORTANT.

Details of Lights, Fog Signals, and Time Signals (visual) are not included in this volume; for this information the Admiralty List of Lights, Vol. 5, should be consulted.

Information regarding Vertical Movement of the Water is not included; for this the Admiralty Tide Tables should be consulted.

Details of Radio information (weather bulletins, storm and navigational warnings, time signals, fog signals, and D.F. stations) are not included; for this information the Admiralty List of Radio Signals should be consulted.

THE MEDITERRANEAN PILOT VOL. I

CHAPTER I

GENERAL REMARKS — STANDARD AND SUMMER TIMES — CURRENTS —
TIDES — MARROBBIO — SEA LEVEL — EARTHQUAKES — SIGNALS —
LIFE-SAVING SERVICES — BUOYAGE — MEASURED DISTANCES — AIR
LIGHTS — SUBMARINE CABLES — PILOTAGE — COMMUNICATIONS —
RADIO STATIONS — FUEL AND REPAIRS — REGULATIONS — FISHERIES —
CLIMATE AND WEATHER

MEDITERRANEAN SEA.—The Mediterranean sea, bounded by the coasts of Europe, Africa, and Asia, is divided into two deep basins which are separated by a submarine elevation connecting Italy, Sicily, Malta, and the African coast.

The distinctive names given to the several portions of the western basin are the Balearic sea, or Sea of Valencia, between *Islas Baleares* and the coast of Spain; the Ligurian sea northward, and the Tyrrhenian sea or *Mar Tirreno* eastward; the northern shore is indented by the deep bays, or gulfs, of *Lions* and *Genoa*, and the eastern coast of Sicily is washed by the waters of the *Ionian sea*. 5 10

The greatest known depth in the western basin is about 1,700 fathoms (3,109^m0), westward of the southern part of *Sardinia*, and in the eastern basin about 2,400 fathoms (4,389^m1), westward of *Crete*. The salinity of the water is in excess of that of the Atlantic ocean, its average specific gravity being 1.028 against 1.026 of the latter. Its temperature, from a depth of 100 fathoms (182^m9) to the bottom, is uniform at from 55° to 56° F., the eastern basin being slightly warmer than the western, and at the entrance of the *Strait of Gibraltar* the temperature of the water on the surface, particularly in the summer, is lower on the African than on the European side. 15 20

At moderate depths, the sea abounds with fish, particularly sardines and tunny; sharks and seals are also seen, but at a greater depth than 200 fathoms (365^m7), life is less abundant than in oceanic waters not cut off from the general circulation, and in its greatest depth life appears to be altogether absent. The coral fisheries are well known, as in no other waters are such beautiful specimens of pink coral to be found. 25

SPAIN.—General remarks.—This country, known to the Spaniards as España, occupies the greater part of the peninsula, sometimes called The Peninsula, at the south-western extremity of the continent of Europe, from the main part of which latter it is separated by the Pyrenees mountains.

The interior of the country is a tableland, the surface of which attains an elevation of some two or three thousand feet (609^m6 or 914^m4). It is nearly surrounded by mountains, which, in some parts, approach within a short distance of the coast.

10 The southern coast of The Peninsula, from Gibraltar to Cabo de Palos, is mostly elevated and rocky, but from that cape to Cabo de San Antonio it is low and sandy, or else rocky.

The eastern coast, from Cabo de San Antonio to the delta of Rio Ebro, the principal river in the eastern part of Spain, is similar to the 15 eastern part of the southern coast, but between the delta and the Franco-Spanish boundary it is alternately high and low.

From west to east, the provinces bordering on the Mediterranean are Málaga, Granada, Almería, Murcia, Alicante, Valencia, Castellón, Tarragona, Barcelona, and Gerona; the last three, together with the 20 inland province of Lerida, constitute the region of Catalonia. Islas Baleares form a separate province.

Products.—Spain is a preponderatingly agricultural country; olives, grapes, citrus fruits, nuts, sugar, wheat, barley, oats, rye, potatoes, onions, esparto grass, flax, hemp, and pulse form the principal 25 crops. Silkworm culture is also carried on, as is the production of honey. The country is rich in minerals, coal, iron, and copper being produced in large quantities. The fishing industry is important, the principal catches being of sardines, tunny fish, and cod. The manufacture of cotton and woollen goods, and of paper and glass, is of 30 importance, as is that of cement and fertilisers.

Agriculture is also carried on in Islas Baleares; there are marble quarries in Majorca, and soft stone, which hardens on exposure, is obtained from Minorca.

Currency.—Weights and measures.—Spanish currency is in the 35 decimal system. The *peseta* is divided into 100 *centesimos*. The metric system of weights and measures is in use, but several old weights and measures persist.

British Consular Officers.—These are stationed at Málaga, Cartagena, Valencia, and Barcelona, in Spain; and at Palma, in 40 Islas Baleares.

SARDINIA.—General remarks.—This island, together with that of Corsica, northward of it, lies on the western side of the Tyrrhenian sea. A large portion of its surface is hilly or mountainous; the principal range runs from north to south, parallel with and at no great 45 distance from the eastern coast, but the land is of considerable elevation in other parts of the island, and there are several extensive and elevated plains. The north-eastern and south-western coasts are considerably indented, and off them, as well as off the western end of the northern coast and the middle of the western coast, are some islands and 50 islets.

The island is one of the Regions of the Republic of Italy, *see* Mediterranean Pilot, Vol. II., and is divided into two provinces, namely, Sassari, in the north, and Cagliari, in the south. The Prefects are the responsible officers in their respective provinces.

55 **Products.**—Sardinia is one of the principal mining districts of

Italy, lead, zinc, iron, copper, etc., being found in the southern part of the island; in this part also there are extensive salt pans. Wheat, barley, etc., are grown in the fertile plains of the south, and there is a considerable production of fruit and wine.

Currency. — Weights and measures. — In Sardinia, Italian 5 currency is used. One *lira* equals 100 *centesimi*. The metric system of weights and measures is in general use.

MOROCCO.—General remarks.—This country, bordered westward by the Atlantic ocean, and northward by the western end of the Mediterranean sea, is divided into three zones, of which the northern 10 coast of the Spanish zone only falls within the area covered by this volume.

The general surface of the country is mountainous, and there are many rich plains and fertile valleys; at from 3 to 10 miles from the Mediterranean coast, the mountains attain elevations of from 3,000 to 15 7,000 feet (914^m4 to 2,133^m6).

In principle, the Empire of Morocco is an absolute monarchy, in which the Sultan exercises supreme civil and religious authority; but in the Spanish zone, the Sultan's powers are entirely delegated to a Khalifa, whose administration is controlled by a Spanish High Com- 20 missioner, resident at Tetuan.

Products.—In the Spanish zone of Morocco, agriculture is potentially important, but is carried on in a primitive fashion; the principal crops are barley, wheat, straw, aldora, beans, olives, maize, and peas. Iron ore is mined in the district near Melilla. 25

Currency.—Weights and measures.—In the Spanish zone of Morocco, Spanish currency is used side by side with the old Hassani currency. The principal native measures still in use are the *Rotl*, which varies widely round about 2 lbs.; 16 *ookeyes* equal one *Rotl*, and 100 *Rotls* equal one *Kantar*. The *mudd* is a measure of capacity 30 which varies according to locality. The measures of length are the *kama*, which equals 50 inches, the *dra*, which equals 20 inches, and the *kala*, which equals 22 inches.

British Consular Officers.—British Consular officers are stationed at Tetuan and Melilla. 35

ALGERIA.—General remarks.—This country is a French colonial possession on the southern shore of the Mediterranean, between Morocco and Tunisia; it is traversed by two of the ranges of the lofty Atlas mountains, viz. the Tell Atlas, in the north, which in places approaches close to the coast, and the Saharan Atlas, farther south- 40 ward. The Tell region comprises the northern slopes of the Tell Atlas range and the plains between the mountains and the sea; it is the most fertile part of the country. The Hauts-Plateaux is an elevated region between the two above-mentioned ranges of the Atlas mountains; it is of variable width, narrowing towards the east. The 45 Sahara, southward of the Saharan Atlas, is a vast plain, of which the level in the western part of the country is higher than that in the eastern part, where it is nearly at sea level.

Northern Algeria embraces the coastal region and is divided into three departments, namely, Oran, Algiers, and Constantine. 50

The government and administration of Algeria are centralised at Algiers, under the authority of the Governor-General, who represents the government of the Republic, the administration being on French lines.

Products.—The greater part of Algeria is of limited value for agricultural purposes, but there are some highly fertile plains and valleys, near the coast, where wheat, barley, oats, maize, and vegetables are produced. Silk and tobacco are cultivated, and wine and olive
5 oil are produced. There are extensive fisheries for sardines, anchovies, sprats, tunny fish, etc., and shell fish are also found. Iron ore, lead, zinc, and phosphates are mined.

Currency.—Weights and measures.—In Algeria, the money, weights, and measures of France only are used. The Bank of Algeria
10 issues notes which are in circulation.

British Consular Officers.—These are stationed at Algiers and Bône.

TUNISIA.—General remarks.—This country, on the southern shore of the Mediterranean, between Algeria and Libya, is a French
15 Protectorate. Its northern part is characterised by its mountainous formation, and in it are large and fertile valleys; in the north-eastern part, including the peninsula of Cap Bon, the soil is specially suited to the cultivation of citrus fruits; the central part of the country consists of high tablelands and pastures; and the southern part is famous for
20 its oases and gardens, where date trees grow in profusion.

The present reigning family have been occupants of the throne since 1705, but the government of the country is carried on, under the direction of the French Foreign Office, by a French Minister Resident-General, with a mixed ministry. The country is divided into nineteen
25 districts and six military circles, the district governors being French and the subordinate officials native.

Products.—The chief industry of Tunisia is agriculture; wheat, barley, oats, etc., are cultivated, and wine and olive oil produced. Lead ore, iron ore, and phosphate rock are mined, especially the last-
30 named. The native industries are spinning and weaving, and the manufacture of leather goods. The fisheries for both fish and sponges are extensive.

Currency.—Weights and measures.—In Tunisia, the currency is similar to that of France. French weights and measures are now
35 generally used, but corn is still sold in *Kaffis* and *whibas*; the Kaffi of 16 whibas, each of 12 *sahs*, being equal to 16 bushels.

British Consular Officers.—These are stationed at Tunis and Sfax.

MALTA.—General remarks.—These islands, in the south-
40 eastern part of the channel between Sicily and the coast of Africa, form part of the British Empire; they are situated on the submarine ridge which separates the western from the eastern basin of the Mediterranean, and are chiefly formed of sandstone, with some beds of marl and coral limestone; most of the soil in the islands was originally
45 brought from Sicily.

The islands possess a constitution. Under the constitution there is a Legislative Assembly, but certain matters are reserved to the Governor, assisted by a Nominated Council.

Products.—Malta produces wheat, barley, potatoes, onions, beans,
50 cumin, vegetables, forages, cotton, and grapes and other fruits; the manufactures are lace, cotton goods, filigree, beer, and cigarettes; there is a considerable fishing industry.

Currency.—Weights and measures.—In Malta, British money, weights, and measures are used.

SICILY.—General remarks.—This island is situated close off the extreme south-western end of Italy, and the greater part of it is mountainous. Monte Etna, *see* page 466, lies near its eastern coast, and southward of this mountain there is an extensive plain. Groups of islands lie off its western and north-eastern extremities, there being 5 two active volcanoes in the latter group.

The island is one of the regions of the Republic of Italy, and is divided into seven provinces, namely, Caltanissetta, Catania, Girgenti, Messina, including Isole Eolie, Palermo, Syracuse, and Trapani, including Isole Egadi; each governed by a Prefect. 10

Products.—Sicily is highly productive, fruits, wine, olive oil, and Indian corn being amongst the chief products. Sulphur ore, rock salt, and asphalt rock are mined.

Currency.—Weights and measures.—In Sicily Italian currency is used. The metric system of weights and measures is in general use. 15

British Consular Officer.—These are stationed at Palermo and Messina.

STANDARD AND SUMMER TIMES.—All information regarding Standard Times and Summer Times will be found in the Admiralty List of Radio Signals, Volume II. 20

CURRENTS.—The Mediterranean sea receives from the rivers which flow into it only about one-third of the amount of water which it loses by evaporation. In consequence, there is a continuous inflow of surface water from the Atlantic ocean, derived from the Portugal current. After passing through the Strait of Gibraltar, the main 25 body of the incoming surface water flows eastward along the northern coast of Africa. This current is the most constant part of the circulation of the Mediterranean, but it gradually loses strength as it penetrates eastward. After passing Cape Bon, it continues south-eastward towards the most northerly part of the coast of Cyrenaica, in about long. 22° E. Thence it flows east-south-eastward setting eastward off the Egyptian coast, and subsequently turning northward along the coast of Palestine. 30

A small amount of water also enters the Mediterranean from the Black sea, as a surface current through the Bosphorus, Sea of Marmara 35 and the Dardanelles.

By evaporation, the Mediterranean water becomes more saline, with a corresponding increase of density. It therefore sinks and the excess of this denser bottom water emerges into the Atlantic ocean, over the sill forming the shallow Strait of Gibraltar, as a west-going 40 sub-surface current below the east-going surface current. A small quantity of water also emerges as a sub-surface current flowing through the Dardanelles, Sea of Marmara and Bosphorus into the Black sea, beneath the stronger surface current flowing in the opposite direction.

The western and eastern basins of the Mediterranean are separated 45 by Italy and Sicily and are connected only by Malta channel and by the narrow Stretto di Messina. The fundamental surface circulation of the Mediterranean consists of a separate counterclockwise movement of the water in each of the two basins, with the main east-going current in Malta channel common to both. The circulation is shown in broad 50 outline in Fig. 1.

The circulation of the western basin is formed by a branch of the main east-going current which flows along the northern coast of Sicily, up the western coast of Italy, and thence along the southern coast of

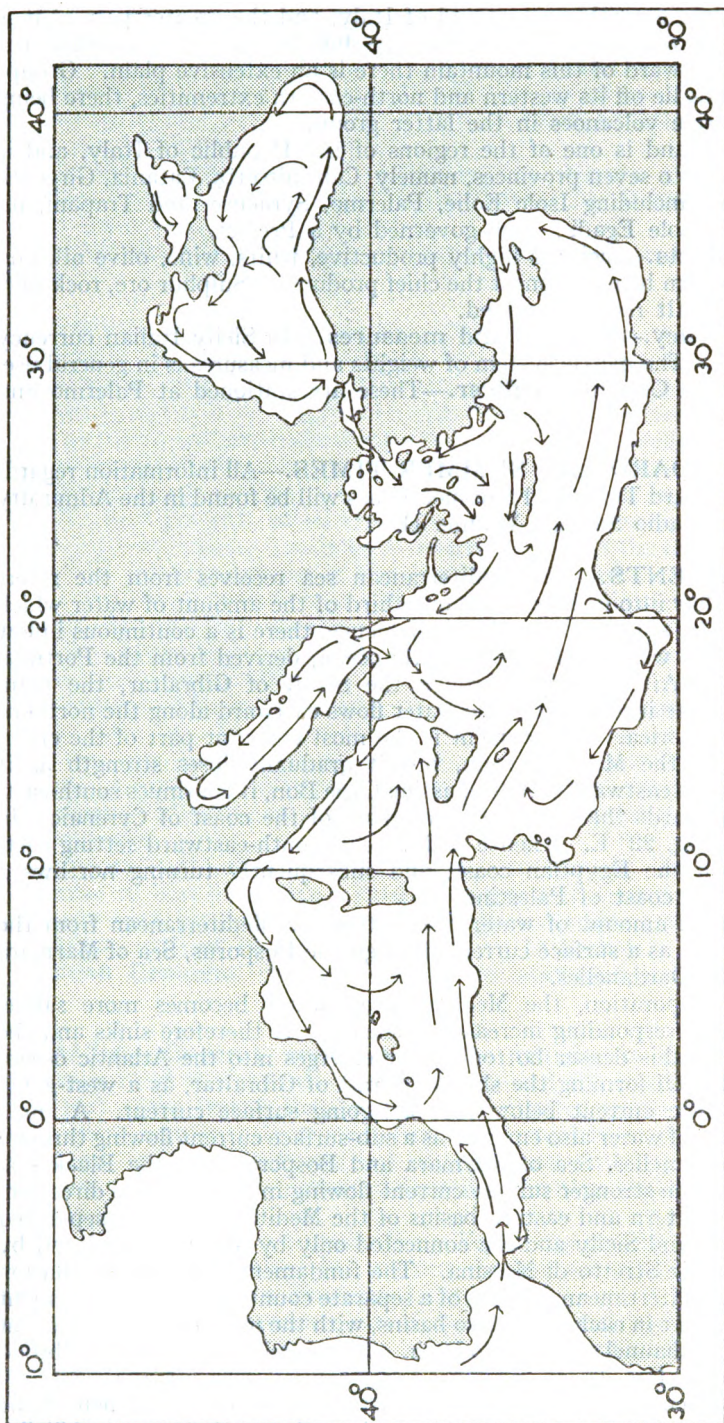


Fig. 1.

France and eastern coast of Spain. The circulation of the eastern basin is completed as follows. The current flowing northward along the coast of Palestine turns westward along the southern coast of Asia Minor. It passes westward along the northern coast of Crete, with a branch making the counterclockwise circulation of the *Ægean*. 5 The current then flows along the western coast of Greece, and a branch makes a counterclockwise circulation of the Adriatic. The current flows south-westward along the south-eastern coast of Italy and finally turns south-eastward in the western part of the Ionian sea to rejoin the main east-going current. 10

The general circulation, described above in broad outline, is not yet fully known in detail. Away from the main shipping routes, the number of available current observations is small and this particularly applies to the eastern end of the Mediterranean, the *Ægean* and much of the northern coastline of the whole of the sea. Owing to the 15 complexity of the northern coastline and the numerous islands there are probably many small eddies and other local currents forming essential parts of the general circulation.

The general circulation is not experienced as a steady flow in all parts of the sea, at the same time; the actual currents are variable. 20 The currents, at any time, are largely affected by the wind, and local drift currents of a temporary nature, but of sufficient strength to mask the general circulation, are set up when the wind has been strong and continuous from any one quarter. It is thus possible, in any part of the Mediterranean, to find a current setting towards any point of the 25 compass; currents directly opposed to those anticipated may sometimes be met. On the other hand, the wind effect may be such as to enhance the strength of the normal circulation, for example, strong westerly winds will temporarily strengthen the in-going current through the Strait of Gibraltar. 30

The degree of variability is not the same everywhere. In the Strait of Gibraltar itself the east-going current is nearly constant in direction. Apart from this, the most constant part of the circulation is that on the route between Gibraltar and Cape Bon. Here, from about 50 to 35 per cent. of all currents observed throughout the year set between north-east and south-east, the majority of these setting due east. The remainder may set in any direction, including westerly sets temporarily produced by easterly gales. From Cape Bon to Port Said, the variability is more marked. The westerly return current along the northern shores and the currents of the central part of the basins are 40 the most variable.

The remarks on current strength which follow are derived from the charting of currents observed during the period 1910 to 1939. The great majority of currents on the main shipping routes do not exceed the rate of one knot; the highest proportion so doing is found between 45 Gibraltar and Cape Bon. The area of strongest current is between Gibraltar and long. 2° W.; here the frequency of currents exceeding one knot is about 25 per cent. from August to October, decreasing to about 10 per cent. from February to April. A few currents with rates of from 2 to 3 knots and over have been recorded westward of long. 2° E. in from May to January; the majority of these occur westward of long. 2° W. 50

Eastward of Gibraltar.—Within about 20 miles eastward of Gibraltar, the current is extremely variable, and special caution is necessary when making the strait from eastward. Thus, in 1936, 55 H.M.S. *Nelson* reported that south-east-going currents, with rates up

to 3 knots, were frequently experienced during the latter half of February and the first week of March, in the area southward of the parallel of Europa point, whereas, northward of that parallel very little current was encountered; the wind during the period was mainly
 5 between south-west and north-west. Between the eastern end of the Strait of Gibraltar and the meridian of Malaga, the main current has sometimes been found to have a rate of 5 knots.

Southern coast of Spain and Islas Baleares.—Along the southern coast of Spain, the rate of the east-going current is variable. Off
 10 Cabo de Gata it is usually strong, and off Cabo de Palos it sets north-eastward. Between Cabo de Palos and Cabo de San Antonio, the current divides, part flowing east-south-eastward southward of Islas Baleares, and part continuing north-eastward into Golfo de Valencia.

In Golfo de Valencia, fresh north-easterly winds set up an onshore
 15 current, part of which raises the level of the sea, and the other part, being deflected by Cabo de San Antonio, sets southward or south-eastward to join the main east-going current, especially if westerly winds are blowing westward of the cape. North-westerly winds, on the other hand, set up an offshore current which lowers the level of the
 20 sea in the harbours and sets south-eastward between Islas Baleares and southward, past Cabo de San Antonio, to join the main east-going current.

Strong, north-westerly winds in the Gulf of Lions set up south-westerly, southerly, and south-easterly currents which, flowing through
 25 Islas Baleares and between those islands and Sardinia, gradually incline eastward to join the main east-going current. South-easterly and south-westerly winds give rise to currents flowing into the gulf, so that a north-going current will then be experienced in the neighbourhood of Islas Baleares, but the main east-going current is not affected.
 30 Minorca, being exposed to the prevailing northerly and north-easterly winds of the Gulf of Lions, a southerly or south-westerly current is nearly always experienced in its vicinity; strong south-westerly winds, however, sometimes cause a north-east-going current off the eastern end of the island.

35 Off the coasts of Sardinia, the currents are usually those caused by the prevailing wind, and attain their greatest rates in the channels between the coast and the adjacent islets. In Bonifacio strait, a north-westerly gale will set up an east-going current with a rate of about 2 knots at times.

40 **Northern coast of Africa.**—On the parallel of Ceuta, the direction of the current is south-easterly, setting towards Cabo Tres Forcas, where it divides, part following the African coast in an easterly direction, usually at a rate of about 2 knots, and part being deflected by the cape, so that an inshore west-going counter-current flows along
 45 the coast of Morocco, towards Ceuta, at a rate of about one knot. In summer, owing to the frequent calms and onshore winds, this counter-current should be specially guarded against by sailing vessels, and every endeavour should be made to keep northward of the parallel of the Strait of Gibraltar.

50 Off the coast of Algeria, the general east-going current is weak, and is frequently masked by opposing currents due to the wind; after several days of westerly winds, the east-going current may attain a rate of $2\frac{1}{2}$ knots.

Along the northern and eastern coasts of Tunisia, as far as Ras
 55 Kaboudia, the currents are very variable, and are mainly due to the winds. In the offing, the prevailing westerly and easterly winds give

rise to fairly strong currents; in the vicinity of Ecueils des Sorelles and La Galite, a west-going current, with a rate of 2 or 3 knots, has been shown to be frequent.

In the channel between Tunisia and Sicily, the main east-going current of the general circulation is found, which, in the vicinity of Cap Bon, attains a rate of from half a knot to one knot; in the middle of the channel, near Skerki bank, the direction of the current is very variable, and with westerly winds it may attain a rate of 4 knots. At Keith reef, with a north-westerly wind, a current setting east-south-eastward at a rate of 3 knots has been observed, though on other occasions it has been found to be setting between north-west and north-north-west.

In the entrance of the Golfe de Hammamet, southward of Ras Maamoura, after a series of north-westerly winds, a current setting southward or south-south-westward has been observed; but it is stated that this current is not felt westward of a line joining Ras Maamoura and Ras Marsa.

Between Cap Bon and Isola di Pantelleria, during a moderate north-westerly gale in February, 1881, H.M.S. *Thunderer* found the current to be setting south-south-westward at a rate of one knot.

In the Malta channel, the current is much affected by the wind, but usually sets east-south-eastward at a rate of about $1\frac{1}{2}$ knots.

Sicily.—The currents in the vicinity of Sicily are usually weak and irregular, and are much influenced by the prevailing wind. Along the southern coast, there is usually a slight south-east-going current, but continued south-westerly winds set up a strong counter-current. Along the northern coast a part of the main east-going current flows into the Tyrrhenian sea, eastward along the northern coast of Sicily and thence north-westward along the western coast of Italy; a west-going current, with a rate of up to three-quarters of a knot, may however be experienced, at times. In Stretto di Messina, the movement is mainly tidal, *see* page 459. Along the eastern coast of Sicily, southward of the parallel of Monte Etna, a south-going coastal current flows, in summer and autumn, at a rate of about 0.2 knot; this current, quite noticeable near the coast, extends from one to $1\frac{1}{2}$ miles offshore; at a short distance beyond it there is usually no definite current. This south-going current seems to be caused by the south-westerly current along the southern coast of Italy impinging on the coast of Sicily in the vicinity of Monte Etna, and there dividing, the north-going part merging with the "montante" of Stretto di Messina.

TIDES.—In the Mediterranean sea, the tides are of small range, and of little practical importance; spring range, however, exceeds 2 feet (0^m6) near the Strait of Gibraltar and in Golfe de Gabès; it amounts to about 3 feet (0^m9) at Málaga and Ceuta, 6 feet (1^m8) at Bordj Djidjelli, and from 3 to 5 feet (0^m9 to 1^m5) elsewhere in Golfe de Gabès.

MARROBBIO.—These consist of waves of surges, isolated or in series, which may raise the sea level by 2 or 3 feet (0^m6 or 0^m9) during undisturbed weather. The period of the waves varies from 10 to 26 minutes. They are most marked on the south-western coast of Sicily, but they occur all along the western, southern and eastern coasts, and around the islands between Sicily and the coast of Africa. They are known as "Marrobbio," "Marrubio," and "Carrobbio" in different localities of Sicily. Their origin is probably associated with fairly abrupt changes in the meteorological conditions prevailing in the

Mediterranean as a whole and not necessarily with changes in local conditions.

SEA-LEVEL.—During February, March and April the mean sea-level in the central Mediterranean may fall as much as $1\frac{1}{2}$ feet (0^m5) below normal.

EARTHQUAKES.—Volcanic eruptions.—Algeria is subject to earthquakes, which frequently occur, and are occasionally very severe. One, in the year 1716, continued with intervals for a month; Blidah, about 21 miles south-south-westward of Algiers, was entirely destroyed
10 by one, and again in 1867 it, and the surrounding villages, were partially ruined. An earthquake destroyed the town of Djidjelli in 1855; and a very severe one occurred at M'Sila, about 70 miles south-south-westward of Bougie, in 1885.

Some earthquake shocks were experienced at Bizerta in February,
15 1899, and although doing no damage, were somewhat severe.

The town of Messina, in Sicily, has twice been destroyed by earthquakes, once in 1783 and again in 1908.

In Sicily is the largest volcano in Europe, namely Monte Etna, *see* page 466; eruptions take place, on the average, at intervals of 4 or
20 5 years.

Isole Eolie are volcanic; the volcanoes in Isola Vulcano and Isola Stromboli being active.

SIGNALS.—Signal stations.—Spanish signal stations are usually painted black and white in vertical stripes.

25 French signal stations are usually situated in prominent positions close to the coast.

Italian signal stations are usually, but not in every case, painted black and white in chequers.

All signal stations are connected with the general telegraph system,
30 and vessels can communicate with them by means of the International Code of Signals. Italian signal stations are usually open from sunrise to sunset, but should a vessel be in sight from any station it will remain open until she has disappeared.

Signal to be made by vessels when inconvenienced by search-
35 **lights.**—In the event of the navigation of a vessel being inconvenienced by the glare from searchlights near a port in the British Empire, she should make the International Code Signal ZO (— — — . — — —) by lamp and by whistle, siren, or fog horn.

Both the light and sound signals should be employed, whenever
40 possible, and should be repeated until the inconvenience is removed.

Only real urgency should necessitate the use of this signal, as unless the vessel is actually in the rays of a searchlight, it is not possible for the operators to know which projector is affected.

This signal is designed to assist mariners; no liability whatever will
45 be admitted.

This signal should also be used in similar circumstances near ports in other countries.

Signal to denote presence of British submarines.—*See* Admiralty Notice to Mariners No. 8 of each year.

50 **Signal to denote the presence of Spanish submarines.**—Spanish warships patrolling an area in which submarines are exercising will display a red square flag. All vessels navigating in or approaching the area, or seeing the above-mentioned flag, should sheer off and

should in all cases proceed with the utmost caution, paying attention to any signals made by the patrolling vessel, either visually or by wireless. Should a submarine be diving outside the prescribed areas, and should she be accompanied by an escorting vessel, the latter will display the signal HP of the International Code of Signals. It does not follow that Spanish submarines are always accompanied by escorting vessels. 5

The prescribed areas, within the area covered by this volume, are in the approaches to Mazarrón and Cartagena; the limits of the former are indicated on the charts by pecked lines, and the latter is between the coast and a line joining Cabo Tiñoso and La Terrosa. 10

Signal to denote the presence of French submarines.—Though French submarines may be encountered submerged in any part of French territorial waters, in the area covered by this volume special caution is necessary in the vicinity of Bizerta. 15

In the approach to certain ports which are frequented by French submarines, special areas have been established in which they are prohibited from diving, and masters of vessels approaching or leaving such ports are particularly requested to do so through these areas; such areas have been established in the approaches to Oran, Algiers, Bizerta, and Tunis, and their limits are described in the body of this volume. 20

Any French submarine which may be navigating submerged within the limits of or in the approach to a French naval port, under such conditions that its power of manœuvring is curtailed, will be accompanied by a small vessel flying in the bows the signal HP, of the International Code of Signals; the escorting vessel usually, but not always, follows the submarine, and any vessel observing this signal should proceed with the utmost caution and keep out of the way of the escorting vessel. 25 30

Signals for British minesweepers.—See Admiralty Notice to Mariners No. 10 of each year.

Signals for Italian minesweepers.—Italian minesweepers, when engaged on minesweeping, show the following signals:—

By day.—A ball at the masthead and a ball at each of the two yard-arms, or at the yard-arm on the side from which the sweep extends, if only one branch of the apparatus is in use. 35

At night.—A green light at the masthead and a green light at each of the two yard-arms, or at the yard-arm on the side from which the sweep extends, if only one branch of the apparatus is in use. 40

The signal HF of the International Code of Signals will be displayed or transmitted by visual means in case of a vessel approaching within one mile.

All vessels must keep at least one mile seaward of the minesweeper if possible. 45

Minesweepers employed on magnetic-acoustic sweeping will show the same signals as those employed on mechanical sweeping which have two branches of the apparatus in use.

Spanish storm signals.—The following storm signals are shown at Spanish ports:— 50

Gale from north-westward:

By day.—A cone, point upwards.

At night.—Two red lights, disposed vertically.

Gale from north-eastward:

By day.—Two cones, points upwards, disposed vertically. 55

At night.—A red light over a white light.

Gale from south-eastward :

By day.—Two cones, points downwards, disposed vertically.

At night.—A *white* light over a *red* light.

Gale from south-westward :

5 By day.—A cone, point downwards.

At night.—Two *white* lights, disposed vertically.

The following additional signals are also shown :—

A square shape, displayed by day, or a *red* light between two *white* lights, disposed vertically, exhibited at night, indicates a local gale of
10 no great force, and that all boat traffic is suspended.

Two cones, points together, displayed by day, or a *white* light over two *red* lights, disposed vertically, exhibited at night, indicate a gale of moderate force and that the port is closed to fishing boats and small craft.

15 Two cones, bases together, displayed by day, or three *red* lights, disposed vertically, exhibited at night, indicate a severe gale and that the port is closed.

Italian storm signals.—Storm signals similar to those shown at Spanish ports are shown.

20 The following additional signal is also shown :—

Gale, direction uncertain :

By day.—Two cones, bases together, disposed vertically.

At night.—A *red* light.

Unless otherwise ordered, the signals will be hauled down at sunset
25 on the day following that on which the warning originated.

French storm signals.—French storm signals remain hoisted, unless instructions to the contrary are received, for 48 hours from receipt of the report from the National Meteorological Office. They are similar to the signals shown at Spanish ports.

30 The following additional signals are also shown :—

Bad weather probable :

By day.—A ball.

At night.—A *red* light at the masthead.

Hurricane or violent gale probable :

35 By day.—Two balls, disposed vertically.

At night.—Two *red* lights, disposed horizontally, at the masthead.

Wind veering :

A black flag or a black cylinder.

Wind backing :

40 Two black flags or two black cylinders, in each case disposed vertically.

The two last signals are displayed, when necessary, alongside the other signals.

Storm signals at Malta.—The following signals are shown from
45 the Palace Tower signal station and from Fort St. Angelo at Grand harbour :—

The North cone signal indicating that gales or strong winds are expected from between west and north :

By day.—A black cone, point upwards.

50 At night.—Three *green* lights, in the form of a triangle, point upwards.

The South cone signal indicating that gales or strong winds are expected from between east, through south, to west :

By day.—A black cone, point downwards.

55 At night.—Three *green* lights, in the form of a triangle, point downwards.

The moderate Gregale signal indicating the risk of a wind between north and east of force 5 to 7, Beaufort scale :

By day.—Two black cones, points upwards, disposed vertically.

At night.—Two *green* lights, disposed vertically.

The strong Gregale signal indicating the risk of a wind between 5 north and east of force 8, Beaufort scale, or over :

By day.—Three black cones, points upwards, disposed vertically.

At night.—Three *green* lights, disposed vertically.

French weather signals.—The following signals are hoisted at signal stations and port offices for half an hour in the morning and 10 evening, and indicate the weather existing at sea :—

A flag of any colour . . . Weather doubtful ; barometer inclined to fall.

A broad pendant . . . Appearance of bad weather ; heavy sea ; barometer falling. 15

A pendant . . . Appearance of better weather ; barometer rising.

A flag over a broad pendant . Entry into the port is dangerous.

No signal . . . Fine settled weather.

Note :—A broad pendant over a flag denotes that the lifeboat is 20 going out.

Italian distress signals.—The following signals will be exhibited as occasion requires at the lighthouses at Capo Carbonara and Punta Filetto in Sardinia, and Punta Timone in Isola di Tavolara :—

Doctor required : 25

By day.—A black square flag, with a white disc in its centre.

At night.—A *white* flare.

Apparatus damaged :

By day.—A pendant, black and white quarterly.

At night.—A *red* flare, followed by a *white* one. 30

Provisions and water required :

By day.—A black ball.

At night.—A *red* flare.

Wreck :

By day.—A black square flag, with a white disc in its centre, 35
above a black ball.

At night.—A *white* flare, followed by a *red* one.

Aircraft in distress :

By day.—A black ball above a black square flag, with a white disc in its centre. 40

At night.—A *white* flare, followed by a *red* one, and then by another *white* one.

Spanish and French distress signals.—Should a shipping casualty occur near a signal station, a black flag will be displayed at the masthead to denote that a casualty has occurred in the vicinity of 45 the station.

The following signals are made when a lifeboat is in sight of the signal station :—

A red pendant displayed above a black flag, by day, or *red* flares exhibited, at night, signify that the lifeboat should steer to the right 50 of the signal station. In addition, a series of *long* flashes may be made by searchlight, by day or at night.

A red pendant displayed below a black flag, or green flares exhibited at night, signify that the lifeboat should steer to the left of the signal station. In addition, a series of *short* flashes may be made by search- 55 light, by day or at night.

A black flag displayed at the masthead by day, or *white* flares exhibited at night, signify that the lifeboat should steer away from the signal station. In addition, a *white fixed* light may be made by searchlight, by day or at night.

- 5 A black flag displayed at the dip, by day, or *red* and *white* flares exhibited, at night, signify that the lifeboat should steer towards the signal station. In addition, a series of *alternate long* and *short* flashes may be made by searchlight, by day or at night.

The following signals may be made, at night, by the life-boat :—

- 10 A *red* flare, signifying "The life-boat is coming to your aid." On this signal being made, the vessel in distress should exhibit lights or burn flares to indicate its position.

A *green* flare, signifying "The life-boat is returning to land." If the life-boat is about to be beached on the coast, several such lights

- 15 will be exhibited, as a signal to the shore party to proceed to the place where landing will be effected.

A *white* flare, signifying "The life-boat requires information as to in which direction she should steer relative to the signal station in order to reach the wreck"; this signal will be answered by one or

- 20 other of the first-mentioned signals.

Entry into and exit from Spanish and French ports in time of peace.—The following signals will be made as circumstances necessitate.—

Entry prohibited, in exceptional circumstances :

- 25 By day.—Three balls, disposed vertically.

At night.—Three *red* lights, disposed vertically.

Entry prohibited, in normal circumstances :

By day.—A cone, point upwards, between two balls, disposed vertically.

- 30 At night.—A *white* light, between two *red* lights, disposed vertically.

Exit prohibited, in normal circumstances :

By day.—Two cones, points together, disposed vertically, over a cone point downwards.

- 35 At night.—A *white* light between two *green* lights, disposed vertically.

Entry and exit prohibited in normal circumstances ; Spanish ports :

By day.—A ball between two cones, points together, disposed vertically.

- 40 At night.—A *red* light under a *green* light and above a *white* light.

Entry and exit prohibited, in normal circumstances ; French ports :

By day.—Two cones, points together, disposed vertically, over a ball.

- 45 At night.—A *white* light under a *green* light and above a *red* light.

Note : Supplementary signals, peculiar to individual ports, may be made if local conditions render them necessary.

- In unimportant harbours, where the traffic is small, the following 50 signals may be made in lieu of the foregoing :—

Entry prohibited :

By day.—A red square flag.

At night.—A *red* light.

Entry and exit prohibited :

- 55 By day.—A red square flag above a green square flag.

At night.—A *red* light over a *green* light.

Exit prohibited :

By day.—A green square flag.

At night.—A *green* light.

LIFE-SAVING SERVICES.—In the area covered by this volume there are life-saving stations at :—

Gibraltar :—Old Mole (B), Europa point (C), Little Europa point (C). 6

Spain, Southern coast :—Málaga (A, C), Torre del Mar (C), Almería (B, C), La Garrucha (C), Mazarrón (C), Cartagena (C), Cabo de Palos (C), Torrevieja (B, C), Villajoyosa (B), Javea (A, C).

Spain, Eastern coast :—Dénia (A, C), Gandia (C), Valencia (A, B, C), 10
Peñíscola (B), Vinaroz (A, C), Ampolla (B), Tarragona (A, C),
Torredembarra (B), Calafell (B), Villanueva y Geltru (B, C),
Sitges (B, C), Barcelona (A, C), Caldetas (C), San Feliu de Guixols
(B, C), Palamós (B, C), Cadaques (B, C), Puerto de la Selva (C).

Islas Baleares :—Palma (B, C), Alcudia (C), Ciudadela (B), Fornells 15
(A, C).

Corsica :—Port Bonifacio (A, C), Île Lavezzi (E).

Morocco :—Ceuta (A, C), Villa Sanjurjo (C), Melilla (A, C).

Algeria :—Nemours (C), Beni-Saf (C), Tenès (C), Cherchell (C),
Tipasa (C), Dellys (C), Bougie (C) and Philippeville (B). 20

Tunisia :—Tabarka (C), Sfax (C) and Gabès.

Malta :—Valletta (F).

Sicily :—Palermo (F), Messina (F).

Note :—A = Motor life-boat, B = pulling life-boat, C = Line-throwing apparatus, D = cliff-ladders, E = Lines and belts, F = Tug 25
or other salvage vessel.

BUOYAGE.—There are two uniform systems of buoyage in use, the “Lateral” system and the “Cardinal” system. They may be used simultaneously, and, if so used, the transition from one system to the other is indicated by a mark painted red and white or black and 30
white in diagonal stripes, with topmark consisting of a cross and two horizontal bars, painted red or black. In cases where no doubt is possible, transition may be indicated by topmarks as described above added to the limiting marks of the two systems.

Lateral system.—This system is generally used for marking well- 35
defined fairways. The term “starboard hand” denotes that side which would be on the right hand of the mariner either going with the main flood tidal stream or approaching or entering a harbour, river or estuary from seaward.

The term “port hand” denotes the left hand of the mariner in the 40
same circumstances.

Starboard-hand marks are conical and are painted black or black and white in chequers.

Starboard-hand topmarks, if any, consist of black cones, or for purposes of differentiation, except at the entrance to a channel, of 45
black diamonds.

Lights on starboard-hand marks, if any, consist of *white flashing* or *white occulting* lights exhibiting *one, three* or *five* flashes or eclipses ; or *green* lights with a character different to those allocated to wreck-marks.

Port-hand marks are can-shaped and are painted red or red and white 50
in chequers.

Port-hand topmarks, if any, consist of red cans, or for purposes of differentiation, except at the entrance to a channel, of red **T**'s.

Lights on port-hand marks, if any, consist of *red flashing* or *red*

occulting lights exhibiting *any number* of flashes or eclipses up to *four*, or *white flashing* or *white occulting* lights, exhibiting *two, four* or *six* flashes or eclipses.

The ends of middle grounds are marked by spherical buoys, which
5 are painted in horizontal bands, red and white where the main channel is on the starboard hand, or the channels are of equal importance, and black and white where the main channel is on the port hand.

Middle ground topmarks, if any, when the main channel is on the starboard hand, consist of red cans on the outer marks and red T's
10 on the inner marks. When the main channel is on the port hand the topmarks, if any, consist of black cones on the outer marks and black diamonds on the inner marks. When the channels are of equal importance the topmarks, if any, consist of red globes on the outer marks and red St. George's crosses on the inner marks.

15 Lights on middle ground marks, if any, will, as far as is possible, be distinctive, and neither colour nor rhythm will be such as to lead to uncertainty as to the side on which the mark should be passed.

Mid-channel marks are of distinctive shapes different from the
20 principal characteristic shapes (conical, can and spherical). They are painted in vertical stripes either black and white or red and white.

Mid-channel topmarks, if any, are of distinctive shapes other than cone, can or globe.

25 Lights on mid-channel marks, if any, are different from the neighbouring lights at the sides of the channel.

Isolated danger marks are spherical and are painted black and red in wide horizontal bands separated by a narrow white band.

Isolated danger topmarks, if any, consist of a globe painted black or
30 red, or half black and half red horizontally.

Lights on isolated danger marks, if any, are *flashing*, either *white* or *red*.

Fairway marks which serve to indicate the seaward approach to a harbour, river or estuary are similar in shape and colour to mid-channel
35 marks, *see* above.

Lights on fairway marks, if any, are *flashing*.

Buoys on the same side of a channel, estuary or tide-way may be distinguished from each other by names, numbers or letters.

Cardinal system.—This system is used along coasts which are
40 fringed with reefs or isolated dangers. The marks vary in character according to the quadrant of the true compass in which they are situated with reference to the danger which they mark.

For this purpose the true compass card is divided into four quadrants, called North, East, South and West, which are bounded by the bearings
45 north-east, south-east, south-west and north-west from the danger point.

The quadrant in which the mark lies can be identified by the characteristics of the mark as follows:—

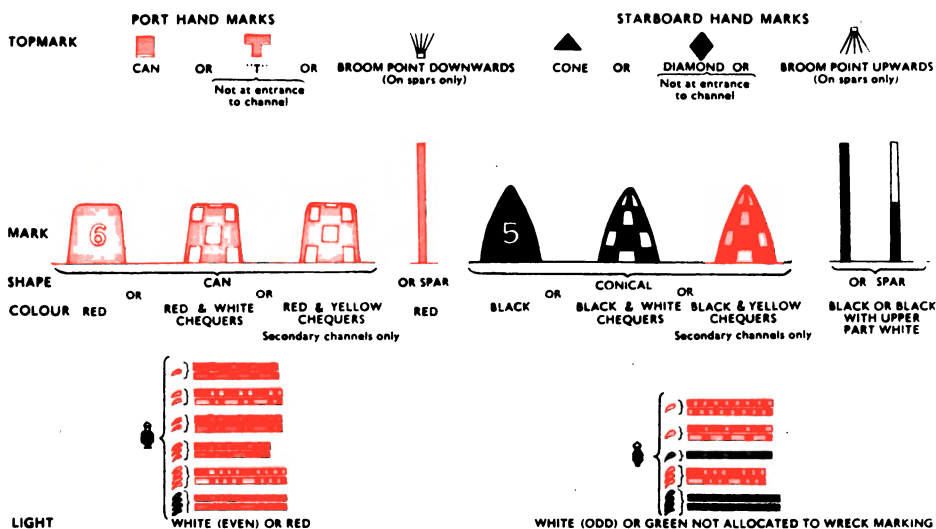
North quadrant:—The buoys are conical, painted black with a wide,
50 white horizontal band in the middle, and are surmounted by two cones points up.

Lights, if any, are preferably *white quick flashing* or else *white flashing* or *white occulting* exhibiting an *odd* number of *flashes* or *eclipses*.

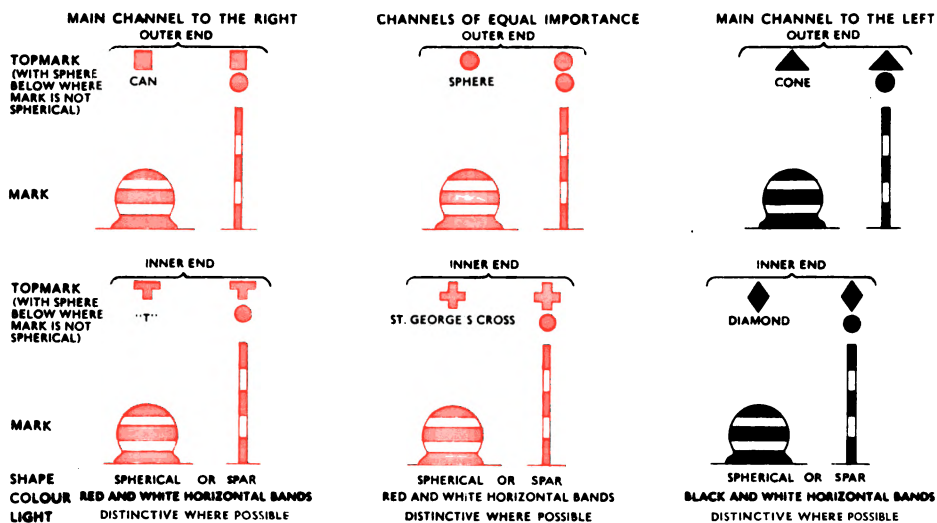
East quadrant:—The buoys are conical, painted, the upper part red
55 and the lower part white, and are surmounted by two cones, bases together.

DIAGRAMS ILLUSTRATING THE UNIFORM SYSTEM OF BUOYAGE

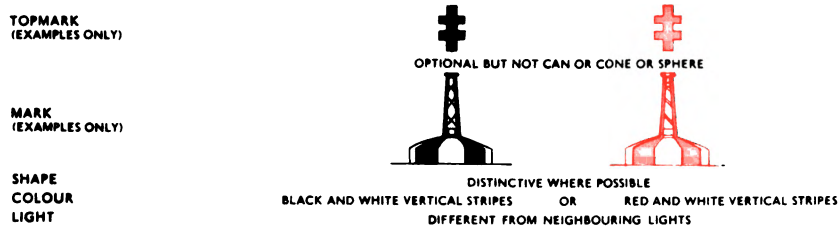
LATERAL SYSTEM



MIDDLE-GROUND OR BIFURCATION OR JUNCTION MARKS

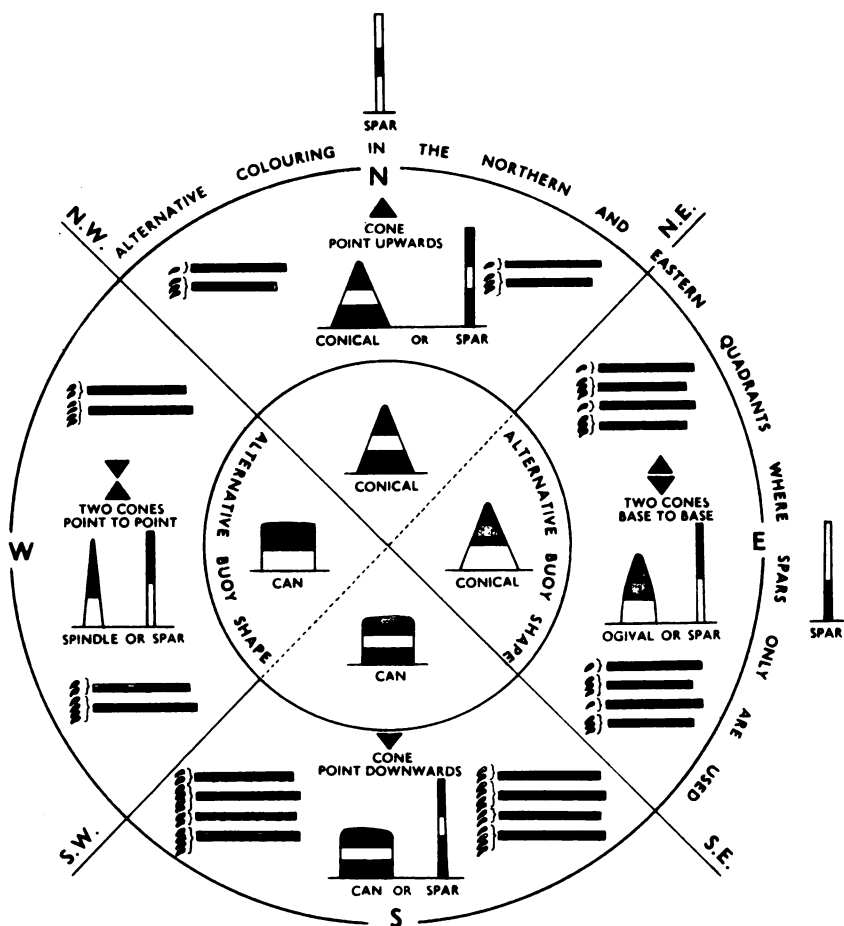


MID-CHANNEL MARKS



DIAGRAMS ILLUSTRATING THE UNIFORM SYSTEM OF BUOYAGE

CARDINAL SYSTEM



NOTE. SLIGHT MODIFICATIONS IN MINOR DETAILS TO THE ABOVE HAVE BEEN INTRODUCED BY CERTAIN COUNTRIES

DIAGRAMS ILLUSTRATING THE UNIFORM SYSTEM OF BUOYAGE

MARKS COMMON TO BOTH SYSTEMS AND OTHER MARKS

ISOLATED DANGER MARKS

TOPMARK



MARK



SHAPE

SPHERICAL OR SPAR

COLOUR

WIDE BLACK AND RED HORIZONTAL BANDS
SEPARATED IF DESIRABLE BY A NARROW WHITE BAND

LIGHT

FLASHING (WHITE OR RED)

FAIRWAY MARKS



OPTIONAL (SEE FOOTNOTE)

BLACK AND WHITE VERTICAL STRIPES OR RED AND WHITE VERTICAL STRIPES

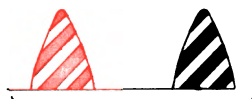
FLASHING

TRANSITION MARKS

TOPMARK



MARK



SHAPE

OPTIONAL (SEE FOOTNOTE)

COLOUR

RED AND WHITE DIAGONAL STRIPES OR BLACK AND WHITE DIAGONAL STRIPES

QUARANTINE-GROUND MARKS



OPTIONAL (SEE FOOTNOTE);
YELLOW

OUTFALL AND SPOIL-GROUND MARKS

MARK



SHAPE

OPTIONAL (SEE FOOTNOTE)

COLOUR

YELLOW ABOVE AND BLACK BELOW

AREAS USED FOR NAVAL MILITARY, OR AIR FORCE PRACTICE PURPOSES

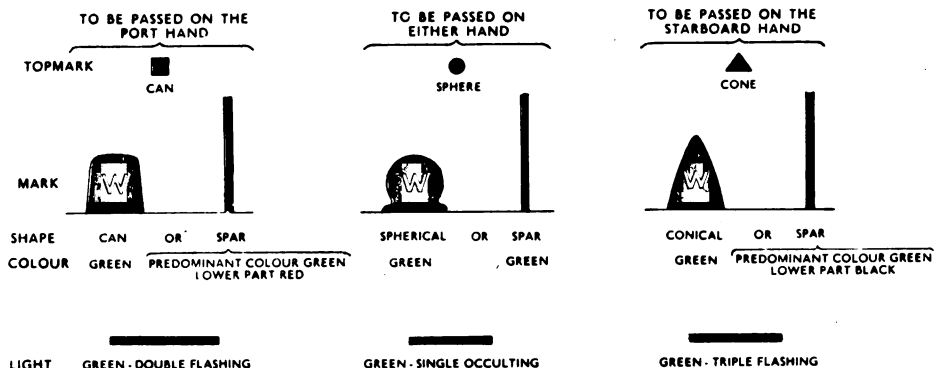


OPTIONAL (SEE FOOTNOTE);
WHITE WITH BLUE CROSS

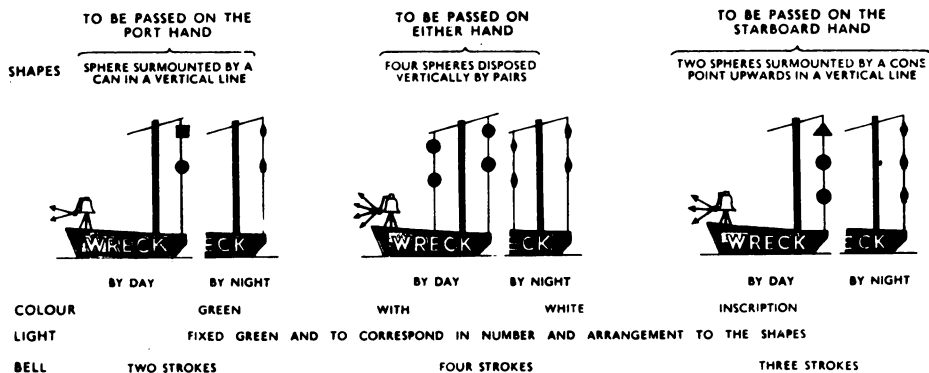
FOOTNOTE. SHAPE IS OPTIONAL AND THE ILLUSTRATIONS ARE TO BE REGARDED AS EXAMPLES ONLY
THE ONLY DEFINITE REQUIREMENT IS THAT THE SHAPE ADOPTED SHALL NOT BE MISLEADING

DIAGRAMS ILLUSTRATING THE UNIFORM SYSTEM OF BUOYAGE MARKING OF WRECKS

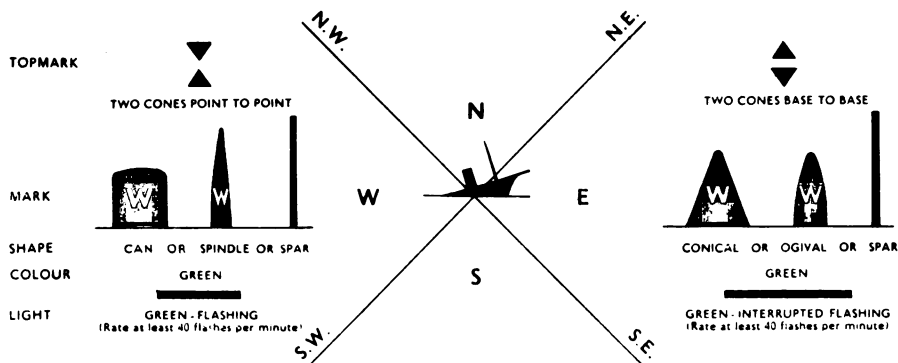
LATERAL SYSTEM BUOYS



VESSELS



CARDINAL SYSTEM



Lights, if any, are preferably *red quick-flashing* or else *red flashing* or *red occulting* exhibiting an *odd* number of *flashes* or *eclipses*.

South quadrant :—The buoys are can-shaped, painted red with a wide, white horizontal band in the middle, and are surmounted by two cones, points down. 5

Lights, if any, are preferably *red flashing* exhibiting an *even* number of *flashes*, or else *red occulting* exhibiting an *even* number of *eclipses*.

West quadrant :—The buoys are can- or spindle-shaped, painted, the upper part black and the lower part white, and are surmounted by two cones, points together. 10

Lights, if any, are preferably *white flashing* exhibiting an *even* number of *flashes*, or else *white occulting* exhibiting an *even* number of *eclipses*.

Isolated danger marks and fairway marks are the same as in the lateral system. 15

Wreck marking.—Wrecks may be marked either by the Lateral or the Cardinal system.

Green is the predominant colour used for all purposes connected with wreck marking, viz. :—For vessels, buoys, daymarks, lights, etc., vessels and buoys have the letter **W** and the word “wreck” in the language 20 of the country under whose authority they lie, painted on them in white letters.

Lateral system.—Wreck-marking buoys which are—

- (a) To be passed on the mariner's port hand—
A can-shaped buoy, and, if lighted, exhibiting a *green flashing* 25 light showing *two* flashes.
- (b) To be passed on the mariner's starboard hand—
A conical buoy, and, if lighted, exhibiting a *green flashing* light showing *three* flashes.
- (c) To be passed on either side— 30
A spherical buoy, and, if lighted, exhibiting a *green occulting* light showing *one* eclipse.

Wreck-marking vessels :—

I. Lights, exhibited between sunset and sunrise :—

- (a) To be passed on the mariner's port hand— 35
Two *fixed green* lights disposed vertically above the hull.
- (b) To be passed on the mariner's starboard hand—
Three *fixed green* lights, disposed vertically above the hull. 40
- (c) To be passed on either side—
Four *fixed green* lights placed in pairs on each end of a crossyard; the lights of each pair being disposed vertically above the hull.

Note :—The ordinary riding light for a vessel at anchor is not 45 exhibited.

II. Shapes :—Between sunrise and sunset green balls or shapes corresponding in number and arrangement to the *green* lights.

III. Fog signal, rung on a deep-toned bell at intervals of not more 50 than 30 seconds :—

- (a) To be passed on the mariner's port hand—2 *strokes* in succession.
- (b) To be passed on the mariner's starboard hand— 55
3 *strokes* in succession.
- (c) To be passed on either side—4 *strokes* in succession.

Cardinal system.—Under this system, wreck marks are placed only in the East or West quadrants and have the following characteristics :—

East quadrant marks are conical, painted green, and are surmounted by two cones, bases together.

- 5 Lights, if any, are *green flashing*, exhibiting groups of *quick flashes* separated by periods of eclipse.

West quadrant marks are can- or spindle-shaped, painted green, and are surmounted by two cones, points together.

Lights, if any, are *green flashing*.

- 10 **Caution.**—In both systems if buoys of the principal characteristic shapes (i.e. conical, can and spherical) are not available, buoys of other shapes or spar buoys may be used in their places. Such buoys will be painted in a similar manner to the marks they replace, and, if lighted, will exhibit lights with similar characteristics.

- 15 **Spanish system of buoyage.**—The Spanish use the Lateral system.

French system of buoyage.—The French use both the Lateral and the Cardinal systems.

- 20 **Italian system of buoyage.**—The Italians use both the Lateral and the Cardinal systems. The systems are being introduced gradually, but the old Italian system may still be found in some places ; the details of the buoyage in such places will be found in the body of this volume.

- MEASURED DISTANCES.**—Measured distances are established off Ensenada de Mazarrón (page 95), on the south-eastern side of
25 Minorca (page 193), at the eastern end of Malta (page 398), northward and eastward of Palermo (page 429).

- AIR LIGHTS.**—Mariners are warned that lights (with definite characteristics), which are not ordinary navigational aids, may be exhibited for the use of aircraft from structures near the coasts
30 described in this volume.

These lights are often of great luminous power and altitude and may be the first lights or looms of lights sighted when making a landfall at night.

These lights normally have the following characteristics :—

- 35 (a) *Flashing white* (revolving beam type).

(These lights are usually screened from seaward but their looms may be visible.)

or (b) *Alternating flashing white and green* (revolving beam type).

- or (c) *Flashing two-letter groups* in the Morse Code, in *red* or *green*.
40

(Although the groups made by these lights may have definite meanings in the International Code of Signals, their signification is to be disregarded ; the fact that they are *red* or *green* in colour, and flash with mechanical regularity, should prevent their being mistaken for signals from shore
45 signal stations or ships.)

- Air lights which appear likely to be visible from seaward will be shown on charts and described in the Admiralty Lists of Lights. As they are subject to changes of which prompt notification to the mariner may not always be possible, care should be taken that they are not
50 confused with marine navigational aids.

SUBMARINE CABLES.—The following Articles are taken from the International Convention for the protection of Submarine Telegraph cables, of 14th March, 1884.

II. It is a punishable offence to break or injure a submarine cable, wilfully or by culpable negligence, in such manner as might interrupt or obstruct telegraphic communication, either wholly or partially, such punishment being without prejudice to any civil action for damages.

This provision does not apply to cases where those who break or injure a cable do so with the lawful object of saving their lives or their ship, after they have taken every necessary precaution to avoid so breaking or injuring the cable. 5

V. Vessels engaged in laying or repairing submarine cables shall conform to the regulations as to signals which have been, or may be adopted by mutual agreement among the High Contracting Parties, with the view of preventing collisions at sea. 10

When a ship engaged in repairing a cable exhibits the said signals, other vessels which see them, or are able to see them, shall withdraw to or keep beyond a distance of one nautical mile at least from the ship in question, so as not to interfere with her operations. 15

Fishing gear and nets shall be kept at the same distance.

Nevertheless, fishing-vessels which see, or are able to see, a telegraph-ship exhibiting the said signals, shall be allowed a period of twenty-four hours at most within which to obey the notice so given, during which time they shall not be interfered with in any way. 20

The operations of the telegraph-ships shall be completed as quickly as possible.

VI. Vessels which see, or are able to see, the buoys showing the position of a cable when the latter is being laid, is out of order, or is broken, shall keep beyond a distance of one-quarter of a nautical mile at least from the said buoys. 25

Fishing nets and gear shall be kept at the same distance.

VII. Owners of ships or vessels who can prove that they have sacrificed an anchor, a net, or other fishing gear in order to avoid injuring a submarine cable, shall receive compensation from the owner of the cable. 30

In order to establish a claim to such compensation, a statement supported by the evidence of the crew, should, whenever possible, be drawn up immediately after the occurrence, and the master must, within twenty-four hours after his return to or next putting into port, make a declaration to the proper authorities. 35

The latter shall communicate the information to the Consular authorities of the country to which the owner of the cable belongs.

Caution.—Cautionary Notes appear on many charts, calling attention to areas in which there are submarine telegraph cables, these areas being indicated by pecked lines on the charts. 40

Every care should be taken to avoid anchoring in such areas, even though there may be no specific prohibition against doing so, in view of the serious interference with communications which results from damage to submarine cables. Equal care should be taken wherever the symbol for a submarine cable (a wavy line) is shown on a chart. 45

Danger involved in cutting a submarine cable to clear anchors or fishing gear.—In the event of any vessel fouling a submarine cable in these areas, every effort should be made to clear the anchor or gear by normal methods; should these efforts fail, the anchor or gear should be slipped and abandoned *without attempting to cut the cable.* *High voltages are, or may be, fed into certain submarine cables; serious risk exists of loss of life due to electric shock, or at least of severe burns, if any attempt to cut the cable is made.* No claim in respect of injury or damage sus- 55

tained through such interference with a submarine cable will be entertained.

Compensation for anchors or fishing gear sacrificed in order to avoid injuring a submarine cable can be claimed under the Submarine Telegraph Act of 1885 (Schedule of Submarine Telegraphs Convention, Article VII).

PILOTAGE.—Spain.—Pilotage is compulsory for merchant vessels, with certain exceptions, at all the major ports in Spain and Islas Baleares ; at a number of other ports, pilots are available, but pilotage is not compulsory ; *see* body of this volume.

Foreign vessels of war are generally exempt from compulsorily taking a pilot in Spanish ports. If possible, they will be directed by signal where to anchor, but if this cannot be done they will have to shift to the position required.

Pilotage is obligatory for all vessels entering artificial harbours and in any navigable river in which pilotage is compulsory for merchant vessels it is also so for vessels of war.

Italy.—Licensed pilots are available at the more important Italian ports and harbours, *see* body of this work.

A vessel requiring a pilot by day should display any of the signals laid down in the International Code of Signals.

French possessions.—The French law as regards pilotage is in force in Algeria ; the purport of the principal articles is as follows ; the remaining regulations should be ascertained on the arrival of the pilot.

Immediately on entering any area in which pilotage is compulsory the signal for a pilot must be displayed, and must be kept flying until the arrival of the pilot. These areas are described in the body of this volume.

On the arrival of the pilot, every facility must be afforded him for boarding the vessel under the best conditions possible.

The master of the vessel must supply the pilot with the following information : the draught of the vessel ; the maximum speed of the vessel ; and the manœuvring qualities of the vessel.

The signals for a pilot are those laid down in the International Code of Signals.

The master must accept the services of the first pilot who presents himself, or those of the pilot whose turn it is as shown by the register of the pilot station.

The master of a vessel intending to leave any port must give sufficient warning to the pilot station, in default of which he will be considered as having endeavoured to evade pilotage, and will be liable accordingly.

With certain exceptions, pilot vessels are painted black with a white band, and have the initial letters of the name of their station inscribed in white on either bow and quarter ; on either side of the principal sail is an anchor together with the initial letters of the name of the pilot station ; steam pilot vessels have an anchor painted on either side of the funnel.

COMMUNICATIONS.—Railways.—Nearly all the continental ports in the area covered by this volume are connected to the general railway systems.

Steamships.—In Spain, the chief maritime centre in the Mediterranean is at Barcelona, and there are regular inter-port services.

Islas Baleares are connected by local services, and steamers run from

Palma to Alicante, Valencia, and Barcelona, and also to Marseilles and Algiers.

In Sardinia, there is regular steamer communication between the Continent and Cagliari, Porto Torres, La Maddalena, and Olbia ; there is also a coastal service. 5

In Spanish Morocco, there is regular steamer communication between Melilla, Ceuta, Oran, and ports in Spain.

Algeria has several lines of steamer communication with French and other European ports ; the principal ports of call are Oran, Algiers, Bougie, Djidjelli, Philippeville, Bône, and La Calle. 10

Tunisia is served by the same French lines as Algeria, the principal ports of call being Bizerta and Tunis ; there is also steamer communication between Tunis and England, and between that port and Italy.

Malta has daily steamer communication with Syracuse and Gozo. 15 There is regular communication with ports in England and northern Europe, and also with the principal ports in the Mediterranean and the Far East.

Sicily is connected by a ferry service with the mainland of Italy. There is regular steamer communication between the main island and 20 those adjacent to it, and also between the principal ports in the former and other Italian ports.

Air services.—At the ports where air-liners call regularly, the fact is mentioned in the body of this work.

Telegraphs and telephones.—All the larger towns, as well as 25 many of the villages, in the area covered by this volume, are connected with the general telegraph and telephone systems.

RADIO STATIONS.—Coastal radio stations in the area covered by this volume, which are open for public correspondence, are established at Gibraltar ; at Cagliari and La Maddalena, in Sardinia ; at 30 Melilla, in Spanish Morocco ; at Oran (Oran-Āin-el-Turk in List) and Algiers (Alger in List), in Algeria ; at Bizerta and Tunis, in Tunisia ; at Malta ; and at Augusta, in Sicily. In 1950, a station was under construction at Palma, Majorca. For details, see List published by the Bureau of the International Telecommunication Union. 35

For details of stations, transmitting weather bulletins, storm signals, navigational warnings, time signals, etc., see Admiralty List of Wireless Signals.

FUEL AND REPAIRS.—At some of the ports mentioned below, the supply of fuel is very small, see body of this volume, and at some, 40 only repairs of a minor nature can be effected ; for ports at which under-water repairs can be undertaken, see page 486.

Spain.—Coal can be obtained at Málaga, Puerto de Motril, Almeria, Cartagena, Alicante, Dénia, Valencia, Vinaroz, Tarragona, Barcelona, San Feliu de Guixols, and Palamós, and in Islas Baleares at Palma 45 and Puerto de Mahón.

Fuel oil can be obtained at Málaga, Almeria, Cartagena, and Barcelona, and in Islas Baleares at Puerto Pi.

Diesel oil can be obtained at Cartagena, Valencia, Vinaroz, Tarragona, and Barcelona. 50

Repairs can be executed at Málaga, Almuñécar, Puerto de Adra, Almeria, La Garrucha, Cartagena, Alicante, Gandia, Valencia, Vinaroz, Barcelona, San Feliu de Guixols, and Palamós, and in Islas Baleares at Palma.

Sardinia.—Coal can be obtained at Porto Vesme, Cagliari, Golfo degli Aranci, and Olbia.

Fuel oil can be obtained at Cagliari.

Repairs can be executed at Carloforte, Sant'Antioco, Cagliari, La Maddalena, and Olbia.

Morocco.—Coal and fuel oil can be obtained and repairs can be executed at Melilla.

Algeria.—Coal can be obtained at Mers-el-Kébir, Oran, Arzew, Mostaganem, Ténès, Algiers, Bougie, Philippeville, and Bône.

10 Fuel oil can be obtained at Oran, Algiers, and Bône.

Diesel oil can be obtained at Algiers.

Repairs can be executed at Nemours, Oran, Beni Saf, Algiers, Philippeville, and Bône.

Tunisia.—Coal can be obtained at Bizerta, Tunis, Sousse, and Sfax.

15 Fuel oil can be obtained at Bizerta and Tunis.

Diesel oil can be obtained at Tunis.

Repairs can be executed at Bizerta and Tunis.

Malta.—Coal and fuel oil can be obtained and repairs can be executed at Malta.

20 *Sicily*.—Coal can be obtained at Trapani, Porto Empedocle, Palermo, Messina, Catania, and Syracuse.

Fuel oil can be obtained at Palermo and Messina.

Diesel oil can be obtained at Palermo.

Repairs can be executed at Trapani, Marsala, Licata, Palermo,

25 Termini Imerese, Catania, and Syracuse.

REGULATIONS.—Harbour regulations are enforced in all the more important ports and harbours in the area covered by this volume ; their tenor should be ascertained on arrival, and they should readily be complied with.

30 **Quarantine.—Deratisation.**—Quarantine regulations are enforced at all the major ports in the area covered by this volume. All ports in Algeria are, in principle, open to infected vessels, except those coming from the countries infected with plague, which vessels can only be entered at Oran, Algiers, Philippeville, and Bône.

35 International Quarantine messages can be sent by wireless to certain ports in Italy, for details *see* Admiralty List of Wireless Signals. These messages can, in no case, take the place of the customary visit of the Health authorities. The only ports in Sicily at which a vessel from an infected port can obtain pratique are Trapani, Palermo, 40 Messina, Catania, and Syracuse, consequently such a vessel bound to any other port in Sicily must first call at one of those places. For a vessel with a case, or cases, of epidemic disease on board, there is a quarantine station at Asinara (Sassari).

In accordance with Article 28 of the International Sanitary Convention of the 21st June, 1926, Deratisation can be carried out, and Deratisation and Deratisation Exemption Certificates can be issued at the following ports in the area covered by this volume.

Spain, south coast :—Málaga, Almeria, Aguilas, Cartagena, Torre-vieja, and Alicante.

50 Spain, east coast :—Gandia, Valencia, Puerto de Sagunto, Grao de Castellón, Tarragona, and Barcelona.

Islas Baleares :—Palma and Mahón.

Sardinia :—Cagliari.

Spanish Morocco :—Melilla.

55 Algeria :—Oran, Algiers, Bougie, Philippeville, and Bône.

Tunisia :—La Goulette and Sfax, also for small vessels at Bizerta, Sousse, Gabès and Houmt Souk.

Sicily :—Trapani, Palermo, Messina, Catania, and Syracuse.

Regulations for approaches to Italian ports.—Sailing vessels, boats under steam or otherwise, tugs or other small craft, within a radius of one mile of the entrance to, or within the waters of, the above ports, or in Italian channels, estuaries and rivers, must keep out of the way of all steam vessels entering or leaving. 5

Steam vessels observing a breach of these regulations should give not less than *four short blasts* on their whistles or sirens. Steam vessels navigating in the above areas should do so with caution and at a reduced speed. 10

In Italian ports and harbours, no aircraft is permitted to alight except in such areas as have been set apart for that purpose. In the event of a forced landing, aircraft should alight outside the port or harbour, or where the state of the traffic is such that absolute safety can be assured. 15

Any vessel being about to put to sea or to enter a port or harbour must, whenever the arrival or departure of any aircraft is announced, delay departure or entry until such time as the aircraft has completed the manoeuvre. 20

When, however, a vessel is already under way in the port or harbour, either entering, leaving, or shifting berth, the aircraft must delay its arrival or departure until the area in which it will execute the manoeuvre is clear. 25

Small craft must at all times keep out of the way of aircraft if it is possible so to do.

Regulations concerning vessels carrying inflammable liquids in Italian waters.—The following regulations are in force in Italian waters :— 30

1. Vessels carrying inflammable materials must secure in the appropriate berths, and must exhibit in a conspicuous position, by day, a red flag, and at night, a *red* light. Such vessels must also have the funnel covered by a spark-proof net, and the masts, or at least the tallest one, provided with an efficient lightning conductor. 35

Tank vessels may only use safety lamps or electric light; whilst taking-in or discharging, the lighting of fires, smoking, etc., is prohibited in or near the place where the inflammable liquid is stored.

2. Whilst taking-in or discharging inflammable liquid, every endeavour must be made to prevent leakage, and special care must be taken to prevent any benzine, petroleum, or naphtha running into the sea. 40

3. Immediate notice must be given to the maritime authorities of the presence on the surface of the sea of any benzine, petroleum, or naphtha, lost, either from the vessel or the pipe-line, during the operations of taking-in, discharging, or working. 45

4. All vessels using liquid fuel are forbidden to pump water overboard from the bilges whilst in port or in the vicinity of the coast.

5. The discharge is forbidden, either in harbour or in the vicinity of a harbour, of any water used for washing hoses or for clearing away inflammable liquid, either from tank vessels, or from shore depots, except in the latter case where there are no means of separating the two liquids. On tank vessels, the water used for general purposes must be kept on board until it can be deposited in the open sea. When- ever, through the exigencies of the service, it is necessary to discharge such water, either in port or while adjacent thereto, it must be 55

done by means of a special lighter, which can later be emptied at sea.

6. Sea water used on board must be evacuated at such a distance from the harbour that there shall be no possibility of the return of any benzine, petroleum, or naphtha.

Note.—Local exigencies may demand, in addition to the foregoing rules, such other regulations as may be enforced by the particular harbour authority after notification by special ordinance.

Regulations for approaching ports in Spanish Morocco.—

- 10 The ports open to commerce, without restriction, on the Mediterranean coast of Spanish Morocco are Rio Martin and Puerto de Villa Sanjurjo.

Vessels wishing to work cargo at Uad Lau or Puerto Capaz must first obtain permission from Rio Martin, and those wishing to do so at Torres de Alcalá or Monte Carmaya must first obtain permission

- 15 from Puerto de Villa Sanjurjo.

In all cases, previous authorisation must be obtained from the Customs at Tetuan.

Regulations for approaching French territorial waters in time of war.—Decree of 1st October, 1934.

- 20 1. In time of war the conditions under which vessels, other than French war vessels, may enter and remain in ports and anchorages of France, her colonies, protectorates, and mandated territories, are governed by the following regulations.

2. No French merchant vessel, nor any foreign man-of-war or
25 merchant vessel, may approach within 3 miles of the coast in the territorial waters of France, her colonies, protectorates, or mandated territories, without permission, without running the risk of being destroyed.

- This prohibited zone is carried to 6 miles * from the coasts off certain
30 naval ports; off Bizerta its limits are the meridians of Ras Enghela and Île Pilau.

3. Every vessel affected by the present decree must display her national flag on approaching the prohibited zone, and also her number in the International Code of Signals; at night, she must show her
35 navigation lights.

If desirous of entering the prohibited zone in order to reach a port, permission must be asked as follows:—

- By day, by displaying the pilot flag (G flag of International Code of Signals) accompanied, if possible, by the International Code signal PT
40 (a pilot is required), made in Morse code by searchlight.

- At night, by making the signal PT in Morse code, followed by her number in the International Code of Signals, or, if she has no means of doing this, by making the night signal for a pilot in accordance with the International Code of Signals, viz., a *white* light flashed or shown
45 just above the bulwarks at short or frequent intervals for *about one minute* at a time at intervals of *fifteen minutes*, accompanied, if necessary by flares.

The vessel must remain outside the zone until she has received a reply from a signal station or an examination vessel.

- 60 The reply from the signal station or the examination vessel is made as follows:—

Entry permitted:

By day, by searchlight, “UI” in Morse code, repeated three times, or flags “UI” of the International Code of Signals.

- 55 * NOTE.—The British Government does not recognise claims to jurisdiction outside the three-mile limit of territorial waters.

At night, by searchlight or flashing light, " UI " in Morse code, repeated three times, or by a *white* flare.

Entry forbidden :

By day, by searchlight, " UJ " in Morse code repeated three times, or flags " UJ " of the International Code of Signals. 5

At night, by searchlight or flashing light, " UJ " in Morse code repeated three times, or by flares *red-green*.

If permission is granted, the vessel must enter the prohibited zone at reduced speed, displaying by day flag G of the International Code of Signals, and at night exhibiting her navigation lights, and must steer 10 for the examination vessel. The latter has normally no distinguishing marks, but if she wishes to show vessels in sight that she is engaged on examination duties, she displays at the masthead a black ball by day and a *red* light at night ; or alternatively " MAJ " in Morse code three times by flashing light. 15

If entry be refused, the visiting vessel must immediately alter course and proceed for some other anchorage.

4. Between sunset and sunrise, all vessels affected by the present decree are forbidden to request permission to enter the prohibited zone off Bizerta, defined in Article 2. 20

Unless a captain has received authorisation from the naval authorities, he may not request permission to enter this zone at night, except when his vessel is in danger and is absolutely unable to remain at sea until dawn, or to reach any other anchorage.

In this case, the distress signals laid down in the International Code 25 of Signals must be made.

5. In foggy weather, every vessel affected by the present decrees desirous of entering the forbidden zone is to display the same signal as in clear weather, and sound blasts on the whistle or siren until permission to enter has been given by an examination 30 vessel.

Entry into the prohibited zone off Bizerta, defined in Article 2, is forbidden in foggy weather under the same conditions as those specified in Article 4.

6. Every vessel affected by the present decree must immediately 35 comply with the orders of a war vessel, or examination vessel, or a signal station. These are given either by a warning gun or by a signal of the International Code of Signals.

Any vessel warned by a battery or vessel of war must immediately alter course by more than eight points (90°), and steer so that she 40 remains within signalling distance of the vessel of war or signal station nearest to the battery that warned her. She may not proceed on her former course until authorised to do so.

If the vessel does not alter course after a blank charge has been fired to warn her, a live shell will be fired a few minutes later, and 45 if the vessel does not immediately conform to this order, effective fire will be opened on her.

In urgent cases, the warning by the firing of a blank charge may be omitted.

At night, the warning shot with live shell may also be omitted, 50 and any vessel entering the prohibited zone without permission is liable to be destroyed without preliminary warning.

7. Vessels authorised to enter roads and ports in France, or in the French colonies, protectorates or mandated territories, must keep 55 strictly within the approach channel.

For this purpose they will be piloted by a vessel set apart for this

duty. Should a port have no such vessel, the examination vessel will send a pilot on board the visiting vessel.

Vessels must take up the berths assigned to them and conform strictly to the special regulations in force.

- 5 The length of stay of a vessel will depend on military considerations, and when circumstances require it a vessel may be ordered to put to sea or to move to another port ; such order must be carried out without delay, though respite may be allowed to vessels really unable to conform to it immediately.

- 10 No vessel is to get under way, either to change berth or to quit the roads, without the permission of the local authority ; a request may be made by displaying G flag of the International Code of Signals.

8. In naval roads and ports, between sunset and sunrise, the movement of boats, other than those of French war vessels, is absolutely
15 forbidden.

From sunrise to sunset, movement is only allowed to boats which have received a special permit from the naval authorities together with the means of making themselves recognisable.

- Boats with permits should steer clear of war vessels if ordered
20 to do so, and must not, in any case, go alongside the latter without their permission. The movement of these boats will moreover remain subject to local regulations, notably those relative to the prohibition to enter certain parts of the roadstead, and to go alongside at any places other than those expressly notified.

- 25 In commercial ports, similar measures will be taken by the local authority to impose the restrictions judged necessary on the movement of boats, due consideration being given to the interests of commerce.

9. Visits by neutral war vessels are governed in time of war as in
30 time of peace by the decree of 29th September, 1929, so far as notification or previous authorisation is concerned, the regulations for entry being governed by the present decree.

10. The measures provided for by the present decree are to come into force on mobilisation or on special notice.

- 35 11. Any infraction of the present decree will lead to such repressive measures as circumstances admit of, in addition to the risks of destruction incurred.

- Temporary closing of French ports.**—Access to French ports may be prohibited, or subjected to certain regulations, on account of
40 naval manoeuvres, exercises, or other causes.

1. A warning signal consisting of three balls, disposed vertically, by day, and three *red* lights, similarly disposed, at night, will be made from a conspicuous position.

2. The same signals will be displayed by the watch vessels.

- 45 3. All vessels wishing to enter or leave French waters when one of the foregoing signals is displayed, by day, should display the pilot flag and wait the arrival of a watch vessel ; at night, the vessel should burn one or more flares, blow blasts on the whistle or siren, and wait the arrival of a watch vessel.

- 50 4. On a hail, or a shot fired, from the watch vessel, all vessels must immediately stop or heave to.

5. Vessels will, should the occasion arise, submit to a visit from the watch vessel, which will give the following information :—

- (a) If a special examination service is established, and in what place
55 it is to be found.

(b) If the entry to the port is closed, and for how long.

(c) If there are any special directions for navigating certain parts.

6. With regard to vessels leaving the port, the necessary instructions will be given, or the examination made, in the port by the Naval authorities.

7. Masters of vessels not complying with these regulations do so at their risk and peril, and are liable for any damage they may cause. 5

FISHERIES.—During certain seasons of the year, fishing nets, of large size and great strength, are moored in various localities for the purpose of catching tunny; they are sometimes more than 2 miles from the shore, and in describing the different coasts their positions 10 will be given, as they should be carefully avoided.

The fishing season varies somewhat in different parts. Off the southern and eastern coasts of Spain, in the vicinity of *Islas Baleares*, and off the northern coast of Spanish Morocco, the season extends from the 1st February to the 30th of October. Off the coasts of Sardinia 15 and Sicily, the season is between March and November, and off the coast of Algeria it is from the 15th of March to the 10th of November. Off the coasts of Tunisia, the season varies in different places, beginning between March and May and ending between July and November.

An abridged description of the nets, and methods of taking the 20 tunny at Favignana, given by E. M. de Garston, Esq., H.B.M., Acting Consul at Palermo, 1899, may be of interest, as the procedure is probably more or less identical at other fishing stations.

Two long arms of net are moored on shore and extended, the western, in a northerly direction for a distance of about $1\frac{1}{2}$ miles, where it joins 25 an island at which the actual capture of the fish takes place; this net, known as the "Coda" or tail, is prolonged from the island, for a further distance of rather more than a mile in nearly the same direction, but inclining somewhat eastward, and is known as the "Coda Alta" or upper tail, and its end terminates in three sides of a square 30 named the "Campile."

The eastern net has a north-easterly direction from the shore for nearly $1\frac{1}{2}$ miles, is named the "Costa," and ends in a similar "Campile"; its object is to prolong the natural coast line, and these two 35 arms circumscribe the expanse of water in which the tunny are moving, and serve to indicate the direction they are to follow to the tunnery.

The nets, from 100 to 130 feet (30^m5 to 39^m6) in depth, are held in position by a special system of mooring lines, the upper part of the net being attached, by vertical lines, to a hawser, known as the "sommel," 40 which is secured by anchors at suitable intervals, and kept afloat by bundles of corks; another hawser, named the "piombo," is attached at the lower side of the net, and weighted by large pieces of stone. These nets act as guides to direct the passage of the fish, which seldom attempt to pierce them.

The tunnery proper is divided into several chambers, closed or 45 opened by raising or lowering net coverings, and as boats are constantly on the look-out for the fish, watchmen, by means of the net coverings, allow the fish to pass through the various chambers, until they reach the last, or chamber of death, which being made of close and heavy hemp netting, and with a bottom, is hauled over a pontoon, thus 50 obliging the fish to come to the surface, when they are despatched by gaffs, fastened to the ends of short poles. A single fish sometimes weighs nearly 1,000 lbs., and it usually takes six men to haul them on board; they are cut up, boiled in copper vats, the cooked pieces 55 being afterwards tinned and covered with olive oil.

Caution.—Apart from the damage that may be done to the nets, should a vessel pass through them, they are usually of such a strength, that, should the propeller become fouled, the vessel might become unmanageable.

- 5 **Marking of nets.**—*Spanish waters.*—Each tunny net is marked by two boats or buoys, one about half a cable seaward of it and the other about half a cable seaward of the outermost warp ; these boats or buoys show :—

By day.—A white flag, with a black "A" in its centre.

- 10 At night.—Two red lights, disposed vertically, on the first-mentioned boat or buoy, and a red light above a white light on the other.

On the approach of another vessel, Spanish vessels, engaged in drag-net fishing, exhibit, in addition to the lights prescribed by the regulations, a torch-light or flare on the side on which the net is.

- 15 When trawlers are working in pairs and it is desired to warn an approaching vessel not to pass between them, a flare will be exhibited on the same side as that on which is the trawl, in addition to the *tricolour* light and the white light prescribed by the Regulations for the Prevention of Collisions at Sea.

- 20 *Italian waters.*—Tunny nets are laid out, almost every year. Some nets remain in position throughout the year, but in such cases their positions are subject to alteration. Under certain circumstances, the marks described below may be temporarily missing.

- The part of the net farthest offshore is marked by a boat or float, 25 with a mast 16 feet (4^m9) in height, on which the following signals are shown :—

By day.—A red ball above a white ball.

At night.—A red light above a white light.

- Nets which do not extend more than 1,000 feet (304^m8) from the 30 shore and are not in the fairway or in a frequented anchorage are exempt from being marked at night.

- On dark nights, small vessels may be encountered fishing by the light of acetylene flares. These lights, owing to the undulatory motion of the sea, may have the appearance of *white flashing* lights, and 35 must not be mistaken for navigational lights. These vessels usually fish in depths of from 8 to 20 fathoms (14^m6 to 36^m6), and may be encountered as much as 10 miles offshore.

- Small fishing boats engaged in sardine net fishing, and extending in close formation for a distance of 4 miles, or more, may be encountered at a distance of 8 miles from the coast of Sicily : these boats 40 carry no special marks or lights to indicate that they are using nets.

- Tunisia.*—The corners of the areas containing tunny nets are marked by buoys each surmounted by two balls, the upper one white and the 45 lower one red.

These buoys are moored on the alignment of wooden or iron beacons erected on the coast and each surmounted by two balls similarly painted.

- The outermost part of the net is marked by a float, with a mast, 16 feet (4^m9) in height, on which the following signals are shown :—

- 50 By day.—A white ball above a red ball.

At night.—A white light above a red light.

Malta.—The seaward extremities of the nets are each marked as follows :—

By day.—A small conical buoy surmounted by a staff and ball.

- 55 At night.—A boat exhibiting two white *fixed* lights, disposed vertically.

They are usually laid in the vicinity of Mellieha bay and between Ponta tal Marfa and Ras il Pelligrin.

CLIMATE AND WEATHER.—The annual rainfall in this region is moderate. Summer, which is the driest season, is often rainless in the southern part, and there is little cloud in that season. The summer is everywhere hot, and the winter cool but with abundant sunshine. 5

Gales are in general fairly frequent from November to May, and occur on nearly one day out of three near the Gulf of Lions, blowing mostly from northward or north-westward. Visibility is generally good. 10

Barometric pressure.—Throughout the year a semi-permanent area of high pressure, known as the Azores anticyclone, is centred westward of the Mediterranean. In winter another semi-permanent anticyclone lies eastward over Asia, and separating the two there is an area of relatively low average pressure (about 1016 mb.) centred off the western coast of Italy, but in summer pressure is low over Arabia and northern India and there is a progressive decrease of mean pressure from west to east across the Mediterranean. Pressure is also rather low to southward, over the Sahara, in summer. 15

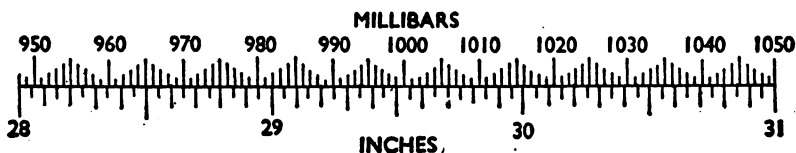
Over most of the region covered by this volume January is the month with the highest mean pressure (1021 mb. at Gibraltar and Oran) and April the month with the lowest (1013 mb. at Barcelona and in Minorca and Sicily). The seasonal variation ranges from about 6 mb. on the Algerian coast to about 3 mb. at Messina. 20

During the winter half of the year, depressions (*see* standard article on "Lows," page xl) are frequent in the western Mediterranean. Some come from the Atlantic across southern France and Spain, or through the Strait of Gibraltar, others form over the Mediterranean itself, especially in the Gulf of Lions and the Gulf of Genoa. The majority move eastward across these gulfs, and then often south-eastward. Many pass down the Adriatic and bring strong winds and squally showery weather to Sardinia and the channel between that island and the African coast. 25 30

In the summer half of the year there are few large and vigorous depressions, but shallow local depressions, almost imperceptible on ordinary synoptic weather charts, sometimes produce strong winds, or even gales, over the limited area which they control. There are also occasional shallow depressions which develop over the western Sahara, some of which, instead of following their usual track eastward, move northward across the coast and cause disturbed weather there. 40

In addition to the variations of pressure due to anticyclones and depressions, a regular diurnal variation of pressure is perceptible in quiet settled weather, with maxima at about 1000 and 2200, and minima at about 0400 and 1600, local time, and a range of about 2 mb. 45

The accompanying diagram shows the equivalent of millibars in inches, and vice versa :



Wind.—Owing to the enclosed nature of the Mediterranean and the presence of high land on nearly all sides, the winds have many local peculiarities, to which special names have been given (*see* summary of regional winds, page 37).

- 5 **General character of the wind twenty miles or more from the coast.**—*Northward of the African coast between Ceuta and Bizerta.*—

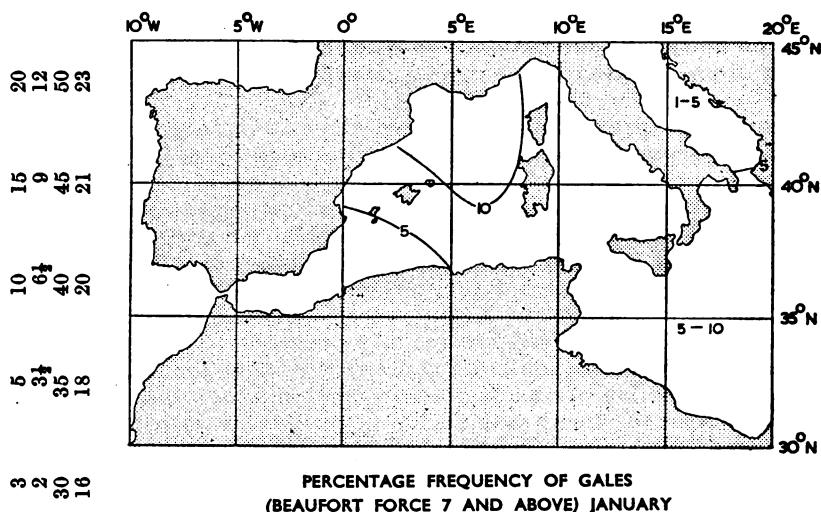


Fig. 2.

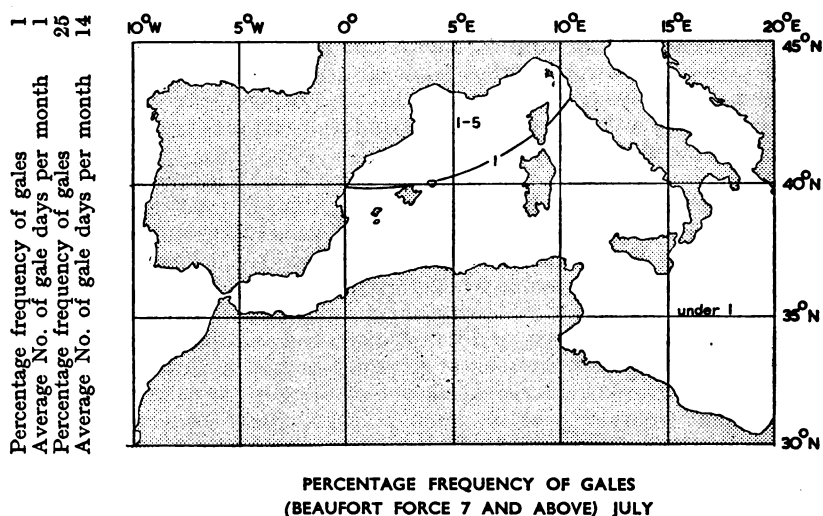


Fig. 3.

In all seasons more than a third of all winds are westerly or easterly, the westerly winds being the more frequent from November to April.

- 10 The characteristic westerly and easterly winds are known in the western Mediterranean by the names "Ponente" and "Levante," respectively. The Ponente usually brings a clear sky, rather dry air and good visibility, although, when strong, it may be accompanied by

heavily clouded skies, with heavy squalls and thunder. The Levante on the other hand is often associated with damp air and overcast skies, mist or fog, and drizzle, but sometimes with heavy rain.

Winds from northward and north-westward, which are uncommon westward of longitude 0° , increase greatly in frequency eastwards. 5 They are most common in winter and least common in summer. Westward of about longitude 0° the wind is from one or other of these directions on about 4 days per month in winter and on 2 days per month in summer; between about longitudes 0° and 5° E. on 7 days per month in winter and 2 days per month in summer; and eastward of 10 longitude 5° E. on 11 days per month in winter and 8 days per month in summer.

Gales are very infrequent from June to September, but occur occasionally in October. From November to May, the wind reaches Beaufort force 7 or more on an average on about from one to 2 days 15 per month westward of long. 0° , on about 2 days per month between long. 0° and long. 5° E., and on about from 3 to 4 days per month farther eastward (see Figs. 2 and 3).

Between the east coast of Spain and Sardinia.—The direction of the wind is very variable in this region. In all seasons westerly, north- 20 westerly and northerly winds are rather frequent, and winds from between east and south rather uncommon. From October to April the most common individual direction is north-westerly, and from May to September generally south-westerly or westerly. Northerly winds are most frequent in winter, especially westward of longitude 5° E., 25 where, from October to March, about half of all winds are from between north-west and north-east. In summer the proportion is only about a third, and there then is little difference between the eastern and western parts of the region.

This region is the stormiest part of the Mediterranean. The Gulf of 30 Lions, in particular, is notorious for the frequency and violence of its northerly and north-westerly gales. These are due partly to the confluence of valleys from westward and northward, separating the Auvergne mountains from the Pyrenees and the Alps respectively, through which valleys winds from between west and north in the rear 35 of depressions find a ready passage. Over the whole region between Spain and Sardinia the number of days per month with winds of Beaufort force 7 or more averages 7 to 9 in winter, and on two-thirds of these days the force reaches 8 or more. There is a gradual decrease in the frequency of gales in spring, but in the Gulf of Lions they occur, 40 on an average, on about two days per month even in July and August, which are the quietest months. Unlike the winter gales, which, although most often from northward or north-westward, may blow from any point between east and west through north, the summer gales are nearly all from between west and north. Figs. 2 and 3 show 45 the frequency of winds of Beaufort force 7 and above in January and July.

Southern and western parts of the Tyrrhenian sea and the sea between Tunisia and Sicily.—North-westerly winds are in nearly all months the most frequent in this region, especially from June to August, when 50 about one-third of all winds are from that direction; over the whole year nearly half the winds are from between west and north. In May, however, north-westerly winds are infrequent, and nearly half of all winds are then from south-westward or westward, and nearly a quarter from north-eastward or eastward. This temporary falling off is due 55 to the fact that the north-westerly winds of the winter half of the year,

which are associated with depressions over the eastern Mediterranean, have practically ceased in May, and the north-westerly winds of summer, which are part of the wind circulation around the low pressure area covering northern India and Arabia, have not yet become
5 established.

Although there are not normally many south-easterly winds, they occur on about four days a month in March, and also in autumn.

Winds reach Beaufort force 7 or more on 2 to 3 days per month from November to May. In other months the chance of a gale is very small
10 (see Figs. 2 and 3). From November to February nearly all gales are from between west and north, but in spring they may be from any direction.

Local coastal winds.—Strait of Gibraltar.—Due to the lie of the land, the winds in the Strait are mainly westerly or easterly. In the
15 winter, westerly winds are more frequent than easterly winds. The easterly winds are sometimes strong in winter, bringing rain and thick weather; they usually last two or three days, and then shift, through south and south-west, to west. Strong south-westerly winds, "Vendavales" (see page 37), occur at times, with squally weather
20 and rain.

In summer, the westerly winds are less frequent, and the easterly winds more frequent, than in winter; at Gibraltar, the easterly winds outnumber the westerly winds, but there is a good deal of variation from one part to another, and probably in the middle of the strait the
25 westerly and easterly winds are about equal.

In the strait, the easterly wind is known as the "Levanter." Outside the strait, the wind may be from between north-east and south-east, but inside it becomes easterly, and increases in strength towards the narrowest part of the strait. It has all the marked characteristics
30 of the easterly wind, bringing excessive moisture, heavy dews, local cloud, a thick hazy or foggy atmosphere, and sometimes rain.

The "Levanter" is most frequent, on the average, from July to October; it may, however, occur at any time of the year. The strength is normally not more than moderate during the above period,
35 and it blows for nearly half the period in spells of as long as 15 days, exceeding force 3 on only one day in eight. In winter, however, although less frequent, it sometimes blows hard.

The pressure distribution usually responsible for the "Levanter" in summer comprises a high-pressure area over western Europe, and the
40 seasonal low-pressure area over northern Africa. The wind is thus not usually a depression wind, but it is occasionally reinforced by the presence of an active depression to southward, and may then set in relatively suddenly, and bring heavy rain and thunder; at such times it resembles the "Levante" storms so well known farther northward
45 on the eastern coast of Spain (see page 39).

The effects of this wind are specially marked at Gibraltar. When it is fresh or strong, violent eddies are formed in the lee of the rock, the wind frequently blowing strong for some time from opposite directions at places only about 50 yards (45^m7) apart. These eddies, with
50 their up and down, and cross currents, are troublesome and dangerous to sailing craft. In winds of about force 3 or 4 a banner cloud, known locally as the "Levanter cloud" or "Levante," usually stretches out from the summit of the rock for distances of a mile or more to leeward. This cloud lifts and disappears if the wind reaches force 7 or over.

55 **South-eastern and eastern coasts of Spain.**—Along the coast of Spain, the winds are mainly offshore in the winter, and onshore in the summer.

In winter, the north-westerly "Maestral" (*see* page 38) is frequent, especially in the northern part; so also are the south-westerly "Vendavales." Gales from north-eastward occur on this coast, and are sometimes severe (*see* "Llevantade," page 39). The direction of the prevailing wind in most regions varies between south-west and north. 5
At Almeria, the prevailing winds are from south-westward and westward. At Cartagena, south-westerly and northerly winds are equally frequent, and together account for more than half of the observations; winds from the south-eastern quadrant are rare. At Alicante, the predominant wind is decidedly north-westerly; there are also moderately frequent south-westerly winds, and less frequent north-easterly ones; winds from southward are infrequent. At Valencia, nearly half the winds are from westward; winds from north-westward, south-westward, and northward are also fairly frequent, and other winds are rare. At Barcelona, westerly and north-westerly winds together 15
account for about one-third of the observations (*see* Climatic Table, page 50).

In the vicinity of Cabo Creus, winds from between north-west and north-east are very persistent in winter, and are frequently strong.

In summer, land and sea breezes (*see* standard article "Local modification of the weather near the coast," page liii) prevail all along this coast in fine weather. At Cartagena, the most frequent winds are north-easterly and south-westerly; winds from westward and north-westward are rare; at Alicante, sea breezes from between east and south are the most frequent; at Valencia, winds from between north-east and south-east and from between west and north-west, and at Barcelona, southerly and south-westerly winds, are the most frequent. 20 25

The land and sea breezes are well developed. At Barcelona sea breezes may occur at any time of the year in fine weather. In March they blow on about four days in ten, and increase in frequency until the period mid-July to mid-August, when they occur on nine days in ten. Thereafter, they decrease slowly, and practically cease by the end of October. At other places, the periods are generally similar, tending however to be longer in the southern part and shorter in the northern. 30 35

The breeze at Barcelona is not at right angles to the coast. It sets in feebly at about 0800 from southward and becomes quite marked by 0900. Thereafter, it usually veers gradually, and is south-westerly or south-south-westerly, i.e. inclined at about 45° to the coast, at 1300, and is almost parallel with the coast by evening. Backing is only about one-quarter as frequent as veering. 40

From a study of the data obtained at thirty-one stations, it has been found that at midsummer the breeze starts at about 0800 almost simultaneously all along the coast. It then extends seawards and landwards, the belt increasing in width at a rate of about 7 knots. 45
Meanwhile the speed increases to a maximum at 1300 or 1400 on the coast. The end is almost abrupt, at about 1800, over the whole area.

The daily setting in and cessation of the sea breezes are usually preceded and followed by short periods of calm. Of these, the evening period is the longer; in fact, in the morning, the land breeze sometimes veers to the sea breeze without falling calm. In the night and early morning, the land breeze blows gently, but not exactly from the opposite direction to the sea breeze. Its general direction, at Barcelona, is north-westerly or northerly, but is often variable; as with the sea breeze, there is a tendency for the land breeze to veer, though 50 55
backing is not uncommon. Sea breezes are stronger than land breezes,

except when they are affected adversely by the general pressure distribution ; the land breeze is then correspondingly intensified at night. Normally, at Barcelona, the sea breeze reaches Beaufort force 4 or 5 in the afternoon between about 1400 and 1700, but the land breeze is
 5 very light.

Between Punta de las Entinas and Cabo de la Nao, a dry, scorching, sand and dust-laden wind, known as "Leveche," blows at times. It extends only a few miles inland from the coast. It is a continuation of the north African "Scirocco" on the eastern sides of depressions.
 10 Its withering and debilitating effects are stated to be but little ameliorated by its passage across the sea, and they are felt as severely in Almeria as in Oran. The wind is not a specially strong one, but it blows usually in a succession of scorching puffs like much of the "Scirocco" in northern Africa. Its onset is ordinarily preceded by
 15 calm or light variable wind, while a streak of brownish cloud, aligned westward and eastward, is observed to rise from the southern horizon. The wind sets in with the arrival of this cloud of dust and sand. Like the "Scirocco," it is not a wind of long duration, though it persists on occasions for over 24 hours (*see* also page 40).

20 *Islas Baleares*.—In these islands there is a considerable difference in the winds from Majorca eastward to Minorca. In the western part, the general character of the winds is said to resemble that of the region between Majorca and Spain, while at Minorca it resembles more closely that of the northern area associated with the Gulf of Lions. At
 25 Palma, in summer, however, southerly and south-westerly winds are very predominant, being reinforced by the local sea breeze. (*See* Climatic Table, page 51).

At Puerto de Mahón, the predominant wind is northerly all the year round, winds from north-westward being much less frequent, as
 30 the high land lying in that direction tends to deflect them northward. At times, these northerly winds blow with such force as to carry the spray across the island. Winds from south-westward, westward, and north-eastward are also fairly common. Winds from between south-east and south-west are frequent in summer ; at that time of the year
 35 they are usually associated with fine weather.

Sardinia.—On the western coast of Sardinia, winds are mainly westerly and easterly at Asinara ; north-westerly and north-easterly at Capo Caccia ; north-westerly and northerly at Carloforte and Capo Sperone in winter, and north-westerly and south-easterly in summer.
 40 At Capo Spartivento, the predominant winds of winter are from between north-west and south-west. Winds from eastward and north-eastward are about half as frequent. In summer, the winds alternate between westerly and easterly, the former being slightly predominant.

45 At Cagliari, the land winds are the most frequent and violent, especially those from northward and north-westward, which predominate nearly two-thirds of the year ; it is said that the winds from seaward never blow home.

On the eastern coast of Sardinia, the winds in winter are mainly
 50 westerly and from between north-east and east ; on the whole, westerly winds predominate at most places. In summer, the winds vary considerably with the locality and calms are frequent. Easterly and south-easterly winds are warm, damp, and oppressive ; locally the easterly wind is known as "Bentu de soli" and the south-easterly
 55 wind as "Maledette levante" (*see* page 40).

Land and sea breezes are well developed in summer ; the sea breeze,

"Imbattu," blows during the day and falls calm at sunset, while the land breeze, "Rampinu," prevails for most of the night.

Coast of North Africa.—In winter, the winds along the coasts of Morocco and Algeria are mainly westerly or easterly, following the general trend of the coast line; there are, however, many local variations. Land and sea breezes occur in fine weather, and deflect the general winds near the coast. For example, at Nemours, in addition to the westerly and easterly winds, there are frequent northerly winds, and also south-easterly and southerly winds; at Oran, also, northerly and southerly winds are frequent, westerly winds being few and easterly winds rare. At Djebel Krichtel, a well-exposed point, westerly winds are decidedly predominant; these westerly winds are often strong—one in three reaches Beaufort force 5 and one in twelve force 7. At Ténès, winds from between west and north are said to be frequent; the northerly wind is stated to set in suddenly and raise a heavy sea. At Bouzaréah near Algiers, the westerly winds again predominate; they are strong at times, reaching force 7 once a month. At Algiers, westerly winds predominate from November to March (*see* Climatic Table, page 55). At Cap Carbon, the prevailing winds are from between south-west and north-west; the north-westerly winds reach force 7 or over about twice a season; easterly winds are few. At Cap Bougaroun, the prevailing winds are westerly and south-westerly, but easterly winds are more frequent than at Cap Carbon. At Cap de Garde, and in the Golfe de Bône, the most frequent winds are north-westerly and westerly.

In summer, there is a general decrease of westerly winds and an increase of easterly winds. Land and sea breezes are in many regions the prevailing winds. At Djebel Krichtel, the westerly wind is still predominant; winds from north-eastward, however, are more frequent than in winter, and alternate with the westerly winds. Bouzaréah also has an increase of wind from between north-east and east, nevertheless, the westerly winds are still the most frequent; there are occasional strong winds, of force 7 and over, from westward and south-westward. At Algiers, the sea winds from between north and east predominate. At Cap Carbon, the winds are variable, but on the whole easterly and southerly winds are the most frequent. At Cap Bougaroun, the winds alternate between west and east, with about equal frequency. At Cap de Garde, the prevailing winds are north-westerly and northerly.

Characteristic disturbances of the hot season near the African coast during spells of easterly wind are the short-lived thunder-squalls from westward, which travel eastward, causing the wind to shift suddenly to westerly at the onset of the squall, and, after an interval of varying duration, to return suddenly to its former direction.

On the northern coast of Tunisia, the predominant wind, all the year round, is north-westerly. At Ras Enghela, it alternates with southerly winds, and at Cap Bon with south-easterly winds; at Tunis, the other winds are variable, but in summer are mainly sea winds from between north and east. On this coast, the winds are in general stronger, and storms are more frequent, than on the coast of Algeria; most of the gales are north-westerly, but gales from other directions are not unknown. Gales are rare in summer, but strong winds are rather frequent. In the north-eastern part of Tunisia, due to the shape of the coast line, the weather is rather variable, and sudden shifts of wind occur. In the group of which La Galite is the principal island, winds from north-westward also predominate during most of the year; in

summer, however, easterly winds are nearly as frequent as the north-westerly ones. Off La Galite, heavy squalls blow down from the high land during fresh winds from between north-west and north-east.

On the eastern coast of Tunisia, there is a more regular seasonal change of wind direction from offshore winds in winter to onshore winds in summer. The north-westerly winds, so predominant on the northern coast, decrease in frequency southward along the eastern coast. At Sousse, the winds in winter are mainly from between south-west and north-west, and in summer from north and north-east; at 10 Gabès, westerly winds predominate in winter, and easterly winds in summer. Gales and strong winds are much less marked on this coast than on the northern coast; strong winds from eastward occur at times, rendering communication with the shore difficult.

Sea breezes are well developed during the hot season, from April to 15 October, in the bays and gulfs of northern Africa; they occur also during fine weather in winter, but are then much weaker and less regular. At many places on this coast, sea breezes constitute the prevailing winds of the summer, and greatly temper the heat of the day. They begin at about 0900 local time, in summer, and at about 20 1000, in spring and autumn, but in winter not until nearly noon. They reach their maximum and blow gustily between noon and 1400, subsequently decreasing to calm at nightfall. There is usually a veer during the day, the wind tending to become parallel with the coast towards evening. These sea breezes are frequently fresh, and, in 25 certain limited regions, they may approach gale force at times when reinforced by the general pressure distribution. For example, at Ténès, the sea breeze from between north-east and east is sometimes violent, especially if it sets in as early as 0700 or 0800.

The true sea breeze does not as a rule extend very far seaward, being 30 limited, usually, to about 20 miles from the coast. Within this distance it modifies the prevailing easterly or westerly wind off the coast. Its effect is to replace the light easterly and westerly winds in the offing by south-easterly or south-westerly winds close inshore.

The land breeze is usually much less marked than the sea breeze. 35 As a rule it sets in at about 2000, after the evening calm, and is strongest in the early morning; after sunrise, the wind decreases to calm, or very light, by about 0800.

Malta.—At Malta winds are rather variable, although those from between north and west are considerably more frequent than those 40 from other quadrants, especially in summer, when about half of all winds are from this sector (*see* Climatic Table, page 58). Strong winds from north-eastward and eastward (*see* "Gregale," page 39) blow at times. Land and sea breezes are weak, and often only just perceptible.

45 *Sicily.*—Near the coast, the winds are mainly from between south-west and north-west, in winter, and north-westerly in summer, but on the coast there are many local variations.

In winter, at Trapani, the most frequent individual wind is south-easterly, but winds from between west and north are also frequent; at 50 Agrigento, the most frequent individual wind is northerly, but the winds are rather variable; at Syracuse, the winds are mainly westerly, south-westerly and north-easterly; at Palermo south-westerly. Along the southern coast of Sicily, strong winds from south-eastward and south-westward are fairly frequent; those from south-eastward 55 usually last for a few days; those from south-westward occur in the course of the veer of the wind from south-easterly towards westerly,

and are of brief duration. On the south-eastern coast, strong north-easterly winds, "Gregale" (see page 39), are more prominent.

In summer, winds are mostly from the sea. Land and sea breezes are well marked along the coasts of Sicily during the warm seasons. The sea breeze, known as "Imbattu" in Sicily, is the more prominent. 5 It sets in during the forenoon, increases to a maximum at about 1400, and falls to calm about sunset. At many places, it gradually veers from morning to afternoon. The land breeze, "Rampinu" in Sicily, is ordinarily less well marked, and in many places it is absent, conditions during the night being calm. 10

Stretto di Messina.—In winter, the predominant wind is north-westerly, but southerly and, in a lesser degree, south-westerly and westerly winds are also frequent. Winds from north-eastward, descending from the mountains of Calabria, are notable on the eastern side of the strait, especially when the mountains are covered with snow. 15 There are sometimes opposing winds; with a fresh north-westerly wind in the Tyrrhenian sea and a south-easterly wind to the southward, there is a heavy sea in the strait.

In summer, winds from between north-west and north-east prevail; the north-westerly winds of winter veer to northerly while the south- 20 erly and south-westerly winds decrease in frequency. During the day the wind is north-easterly at places on the eastern side of the strait, and north-westerly or northerly elsewhere. It is light in the middle of the strait, while on the coast, where it sets in about sunrise, it blows fresh in the afternoon, and subsides often to dead calm after sunset. 25 Opposing winds are frequent, for example southerly winds from Malta channel may meet north-westerly winds from the Tyrrhenian sea, causing choppy conditions in the strait.

Regional winds.—*Vendavales.*—These are the characteristic south-westerly gales and strong winds of the western part of the region, i.e. 30 the channel between the southern coast of Spain and northern Africa, and the sea from Spain as far eastward as Islas Baleares, and are quite distinct from the winds from between south-east and south-west which occur occasionally in summer, and which are usually light and associated with fine weather. Vendavales are due to depressions 35 moving into the western Mediterranean through the Strait of Gibraltar, or across Spain or southern France, and are most frequent, as a general rule, in autumn and spring, i.e. during the months October to November and March to April, and least frequent in summer. They occur less often off the north-eastern coast of Spain than in the southern part. 40 Persistent south-westerly gales are not common, but the setting in of the winds is associated with violent squalls and thunderstorms. In the northern part of the region, with the increased fetch over the open sea, "Vendavales" bring heavy rain and thick weather which may completely obscure the Spanish coast and Islas Baleares. They may 45 cause much damage at ports, such as Barcelona, which are exposed to them. Their characteristic squalls often bring sudden temporary shifts of wind to north-westerly and intervals of clear weather. Spells of south-westerlies are usually terminated by a veer westward; the wind then abates and the cloud decreases, but subsequently the strong wind is frequently renewed for a day or two from north-westward, with 50 clearing skies and gradually moderating strength. A renewed backing towards south-westward indicates the approach of another cold front and the probable recurrence of strong wind. 55

Along the southern coast of Spain, "Vendavales" do not reach the 60 land when there is snow on the mountains, but fall off, or become

westerly to north-westerly in the offing ; for example, vessels may experience fresh south-westerly winds from Gibraltar to Málaga, but a moderate westerly or north-westerly wind in Ensenada de Málaga.

Near the shelter of the north African coast, the speed of the " Vendavales " is reduced.

Tramontana, Maestral, Mistral.—These are northerly, north-westerly, and westerly gales and strong winds. Depressions moving eastward over southern France, the Gulf of Lions, or the neighbourhood of Islas Baleares sea give rise to frequent strong north-westerly winds, known as " El maestral," across the northern parts of the Spanish coast. These winds increase in strength away from the coast, and frequently drive vessels to the shelter of Islas Baleares. In the gulfs along the coast, the winds are subject to the usual local variations. For example, in Golfo de Valencia, north-westerly gales haul westward near Cabo de Oroposa, and northward near Cabo de San Antonio.

In Minorca, these north-westerly winds merge with the north-westerly French " Mistral " and the northerly " Tramontana " ; winds from between north-west and north-east blow at Puerto de Mahón during two-thirds of the year ; they may continue for fifteen consecutive days or, with only brief interruptions, for as much as two months. Strong winds from these directions are frequent in winter and spring and occur occasionally in summer. They are, when established, associated with clear or partially clouded skies in the west of the region.

On the eastern coast of Spain, the approach of a north-westerly gale is frequently indicated by an unusual clearness of the atmosphere, showing distant land with great distinctness ; in Islas Baleares and Sardinia, with the increasing fetch of such a wind across the sea, showers may develop.

In the channel between Sardinia and the coast of Africa, the gales are usually preceded by south-westerly winds. They may, however, set in with north-easterly winds or easterly winds which back towards or beyond north, from which quarter they blow with great violence ; such gales are associated with depressions which move north-eastward from Tunisia, and are most liable to occur in the late winter or spring.

Off the coast of northern Africa, gales from westward and north-westward are associated, in the western part and centre of the region, with depressions that have moved eastward through the Strait of Gibraltar or across southern Spain, and on between the northern coast of Africa and Islas Baleares, and in the eastern part of the region, either with these or with depressions moving south-eastward from the Gulf of Genoa or northern Italy.

Off the coast of Morocco, these storms usually begin with rain and squalls from south-westward ; the south-westerly winds veer through west to west-north-westerly, from which quarter the winds blow hardest, usually moderating as the shift continues to north-westerly.

Off the coast of Algeria, the winds set in from westward, as a rule, increasing to gale force with the passage of the cold front of the depression and the accompanying shift to north-westerly or north-north-westerly ; in these parts, the gales are frequently preceded by a heavy swell from northward, and their onset is accompanied by characteristic cold-front cloud and thunderstorms with heavy rain.

From time to time, after the gale has moderated, the north-westerly winds back again towards westerly with the approach of secondary cold fronts, and the gale is renewed.

In the western part of the channel between Sicily and the coast of

Africa, the most frequent direction of the strong winds and gales is north-westerly; farther eastward and southward, along the south-eastern coast of Tunisia, north-westerly winds become less strong.

Llevantade, Gregale.—These are north-easterly gales and strong winds. Gales from between north-north-eastward and east-north-eastward are the most important gales off the eastern coast of Spain. They are locally known as “Llevantades” in Spanish waters and as “Gregales” in Italian, and are an intense form of the “Llevante,” or “Levante,” i.e. north-easterly winds of long fetch. These gales are most frequent and dangerous in spring and autumn, i.e. from February 10 to May, and October to December; from June to September levantes are seldom strong, and, when they are, do not last long. There are usually eight or nine levante type gales a year between Valencia and Cabo Creus; southward of Islas Baleares exact data are not available, but these gales are much less frequent, and probably average only one 15 or two a year.

In summer the “Levante” is often introduced by a bank of cumulonimbus cloud which approaches from north-eastward and obscures the north-eastern horizon. On the arrival of the cloud mass, there is a sudden change of wind from south-south-westward towards north-eastward, with a squall of the ordinary cold-front type. The air is 20 moist but not saturated; it brings haze along the coast, and mist or cloud on the coastal hills. The cloud at the front does not give rain of long duration, nor does it penetrate far inland, but remains as a strip 25 along the coast.

Most levante type gales are associated with high pressure over the Atlantic and mid-Europe, and low pressure towards Africa. The stream from north-eastward is then very extensive, and its strength corresponds with the pressure gradient. Temperature is below normal; rough seas set in when the wind becomes strong. If the 30 cloud does not penetrate far inland, it also does not extend far out to sea. Rainfall may be very heavy on the coast; the most severe storms occur when a depression is centred between Oran or Algiers, and Islas Baleares. If the depression moves northward and lingers in the neighbourhood of Islas Baleares, heavy continuous rain falls along 35 the northern part of the Spanish coast. If, on the other hand, the depression moves away eastward, it soon ceases to produce strong winds on the Spanish coast. At the time when such depressions are causing north-easterly gales on the Spanish coast, they may be producing south-easterly gales in Islas Baleares. 40

Gales of the levante type may also be due to shallow secondary depressions. Some of these depressions come from the Atlantic through the Strait of Gibraltar, or across Spain; most often, however, they form in situ when the primary depressions with which they are associated reach the British Isles, and westerly winds have advanced 45 half-way across Spain. The secondary then appears as a bulge in the isobars round Islas Baleares, and is often very ill-defined. After a few hours, the wind and swell get up from north-eastward, with low cloud, probably heavy rain, and a falling temperature; these conditions are terminated by the setting in of a north-westerly wind after 50 a short intervening calm. It should be noted that such secondaries do not invariably cause “Levante” on the coast of Catalonia; the north-easterly current at times does not extend as far to the west as this coast.

On the coast of Spain, a heavy swell sometimes precedes the strong 55 north-easterly wind by as much as 24 hours (see page 47).

Winds from north-eastward on the coast of Catalonia may also be associated with the north-westerly "Mistral" of the Gulf of Lions, but these winds weaken as a rule in their passage southward along the coast of Spain, and are only moderate off Barcelona. Such winds increase and back with increasing distance eastward from Spain. The frequent north-westerly and northerly gales of the Gulf of Lions, and of Minorca and Sardinia, are examples of the Mistral.

In the channel between the southern coast of Spain and Morocco, north-easterly gales occur when there is a steep pressure gradient associated with high pressure over Spain, and are strong if there is at the same time a depression moving eastward across Morocco. In the channel between Sardinia and the coast of Africa, they may follow the passage of cold fronts associated with depressions moving south-eastward in the vicinity of Italy, or depressions moving north-eastward from Tunisia. When a full gale occurs, pressure is as a rule above normal over the northern Mediterranean at the same time as it is below normal over northern Africa.

In the channel between Sicily and the coast of Africa, the north-easterly winds of the western part of the channel are not often stormy, but eastward and southward these winds increase in number and in strength. At Malta, and also on the eastern coast of Sicily, they are of special importance owing to the orientation of the principal harbours from south-westward to north-eastward. They may raise waves of about 20 feet (6^m1) from trough to crest, and on occasions a heavy swell continues for one or two days after the wind has dropped. Here, as at the other places in the central and western Mediterranean, they are known by the Italian name "GREGALE." Their frequency in any one month rarely exceeds four, and they are most frequent from November to March. They occur most often with high pressure northward of Malta and low pressure southward, the barometer being normal at Malta; in this case there is little or no rain, and the temperature is not much below normal. They also occur after the passage of a depression, either over Malta and moving south-eastward, or southward of Malta, when the barometer is rising at Malta. In these cases there may be considerable rain. Individual Gregales may last anything from a few hours to five days; Gregales reach gale force only when the pressure is unusually high to the northward of Malta.

Scirocco.—This name is widely used in the Mediterranean for disagreeable winds from southerly directions. The special feature of the winds is in practically all places heat. In some cases the heat is accompanied by a dryness which withers vegetation and may fill the air with dust, and in other cases by extremely high humidity. These winds occur along the northern coast of Africa and in Malta and Sicily, and also in Sardinia, where they are known as "Maledette levante." Along the northern coast of Africa, the "Scirocco" is well known as an excessively hot, dry, dusty, southerly wind from the desert, which blows fairly frequently during the hot season. The name is often applied also to dry, dusty, southerly winds from the desert at other times of the year; but in the cool season, the wind is as a rule only pleasantly warm.

The frequency, in days per month, with which these winds may be expected on the African coast, is indicated approximately below.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
3	2	4	4	6	5	5	5	5	5	3	4	51

The direction from which the wind blows varies between south-east

and south-west. The strength of the southerly current is usually only light or moderate, and the air comes in puffs or gusts. At times, however, winds of gale force are recorded. There is a decided diurnal variation of speed, the maximum occurring in the afternoon.

The dry type of "Sirocco" extends at times for long distances over the sea. This type occurs most frequently in the western part of the region. It is only rarely that it is experienced far from the African coast in the longitude of Malta; it is then a strong wind sometimes known at Malta as "Khamsin," filled with fine dust, and obscuring the sun with a leaden pall.

The type of "Sirocco" usually associated with the Malta channel is the excessively humid type. Its direction is south-easterly, and its speed low, rarely exceeding force 2 at Malta. On leaving the coast the hot air soon gains moisture from the sea, and is cooled by contact with the relatively cold sea surface. As a result, the relative humidity becomes very high. The associated weather is warm, hazy and very enervating; a continuous layer of low stratus cloud is common, while on land the dew is sometimes so heavy at night that the gutters run with water. The "Sirocco" may occur in any season, but it is most disagreeable in autumn.

The pressure distribution giving rise to the "Sirocco" varies according to the season, but the wind is always a depression wind. The "Sirocco" of early spring is often due to depressions which have entered the southern Mediterranean from the Atlantic, and are moving eastward along the northern coast of Africa. In the late spring and summer, it is often due to depressions which have developed over the western Sahara, or to very shallow local depressions which, though not discernible in the isobars of the ordinary synoptic charts, may yet be associated with strong local winds. In the early autumn, the "Sirocco" winds tend to be due to larger but ill-defined low-pressure areas, and are correspondingly light.

The onset of the strong, hot "Sirocco" of the hot season occurs in stages corresponding with the approach of the depression from westward. The wind is at first light from between east and south-east. This wind veers southward, and meanwhile a thin veil of cirrus cloud often spreads across the sky from westward, though there may be no lower cloud. The southerly wind strengthens and veers, with rising temperature, falling humidity, and increasing dustiness; the wind may reach gale force from southward or south-westward, blowing in scorching gusts, with rapid oscillations of temperature and humidity, and the cloud may thicken to alto-cumulus. With the passage of the cold front of the depression, the wind veers rapidly to westward or north-westward, the temperature falls, and the atmosphere clears; a few drops of rain may reach the ground in the vicinity of the front during the hot season, while in the transition seasons thunderstorms occur at times; the rain in these storms frequently carries down a considerable quantity of mud, consisting of fine dust and sand picked up by the wind over the desert.

Contrastes.—Sometimes, at short distances apart, winds are blowing from opposite directions; these opposing winds are known as "Contrastes." Over the channel between the southern coast of Spain and Morocco, and especially in the Strait of Gibraltar, it frequently happens during the spring and autumn that there are easterly winds on the coasts, while in mid-channel a fresh westerly breeze prevails. Also, eastward of the strait, in winter, there may be an easterly wind off the Spanish coast, and a westerly wind off the coast of Morocco. On

the other hand, in summer, off the northern coast of Africa, there is often an easterly wind with all its characteristic moistness and thick atmosphere, while off the coast of Spain there is a fresh westerly wind with fine weather and good visibility ; at such times there is a calm, or
 5 light variable winds, in mid-channel. Again, during the strong winds of spring and autumn, large eddies may form in the lee of the capes along the Spanish coast, so that the winds on the two sides of the capes are from opposed directions. For example, near Cabo de Gata, there may be a westerly wind westward of the cape and an east-north-
 10 easterly wind eastward ; near Cabo de Palos, the wind southward may be south-westerly, and northward of the cape it may be northerly ; similar conditions may occur near Cabo de San Antonio.

Such "Contrastes" may be expected to occur when strong westerly winds are blowing off the western end of the Strait of Gibraltar, and
 15 when strong winds or thunderstorms are prevalent. At times, the "Contrastes" cause heavy seas along the Spanish coasts ; these winds are not so strong along the African coast. The type associated with the thunderstorms is apt to occur in company with waterspouts due to the same storm.

20 **Cloud.**—There is in all seasons much less cloud, both at sea and on the coast, in this region than around the British Isles.

In general the cloudiest months at sea are November to April, when the sky is on an average from four- to six-tenths covered, and the least cloudy months July and August (average from two- to three-tenths).
 25 On the coast the seasonal variation is in general very similar, but on the coasts of Sicily, and at Tunis, from December to February, the sky is on an average as much as from six- to seven-tenths clouded ; at Oran, on the other hand, the average is only about three-tenths in winter, owing partly to the frequency in that season of southerly
 30 winds, which blow down from the mountains of the interior.

Rain.—The annual rainfall in this region averages about 24 inches, and is therefore nearly the same as that of south-eastern England, but some parts are more than twice as wet as others, and occasionally there are years with 50 per cent. more or less than the average. Gibraltar
 35 normally receives about 35 inches and Messina over 30 inches, but Oran barely 15 inches.

At most places the rainfall is largely seasonal, summer being the dry time of the year, autumn and winter the wet seasons. On the African coast, July and August are generally rainless, and at Malta, June also.
 40 At Barcelona the seasonal variation is comparatively slight, the monthly average reaching 3 inches in only two months—September and October—and falling to one inch in July only ; at Palma the driest season is summer, with altogether nearly 2 inches, and the wettest autumn, with more than 7 inches. At Gibraltar, on the
 45 other hand, as much as 29 inches falls altogether in the six months October to March, and less than 2 inches in the four months June to September.

In most regions the rainy season begins in September, but on the African coast frequently not until October. It usually begins with
 50 thunderstorms, and these first rains on the African coast are often very heavy. Although much of the rain in this region, especially on the African coast, comes in showers, more prolonged rainfall is by no means uncommon in autumn and winter, and more than 11 inches has fallen during a single October day at Malta, and nearly 8 inches in a
 55 day at Gibraltar both in January and March.

The number of days per month with appreciable rain (0·04 inches or

more) averages about 10 at Gibraltar from October to March, and more than a third of these are estimated to be days of considerable rain (0·40 inches or more). At Oran in winter the number of days per month with appreciable rain is about 5 and with considerable rain nearly one.

Thunderstorms may occur at any time of the year. They are most common in autumn both at sea and over most of the coastal regions, except on the Spanish coast northward of about lat. 39° N., where they are rather more frequent in summer. The proportion of the total rain due to thunderstorms is in general greatest in summer and autumn. The area most subject to thunderstorms is the Algerian coast between about longitudes 2° E. and 8° E., where they occur on an average on about 5 days per month in autumn. Over the rest of the region the frequency is much less. Hail is liable to occur anywhere in the region, but is seldom encountered on the eastern coast of Spain; its frequency is greatest in late winter and early spring, and it is usually associated with thunderstorms.

Snow rarely falls at sea level, even in the northern part of the region; it is unknown at sea level on the coast of Morocco.

Fog and visibility.—Over the open sea in this region, fog is on the whole infrequent, and, when it occurs, is often patchy. It is most common from June to August, when it may be expected on one or two days per month between the south-eastern coast of Spain and Africa, and on one day per month, or less, elsewhere. In other months it is even less common, and from November to February occurs on about one day per month between the south-eastern coast of Spain and Africa, and on one day in two or three months elsewhere.

On the coast there is not everywhere the same degree of immunity from fog. In particular, smoky industrial or low-lying marshy regions, especially if sheltered from the wind by hills or mountains, may in winter experience several days per month with fog. These radiation fogs, which form on nights with little wind or cloud, generally clear soon after sunrise, unless aggravated by smoke. On exposed and little populated parts of the coast there is generally less than one day per month with such fog.

Another source of reduced visibility is the dust or sand carried out to sea from Africa by southerly winds. When due to the Scirocco (*see* page 40) the reduced visibility may be continuous over a large area, but the effects of isolated sandstorms may be very local.

Strong southerly winds may result in sand or dust storms during which visibility falls below 1,000 yards. Dust haze insufficient to give the equivalent of fog, but enough to reduce visibility to less than 5 miles, is fairly common from April to September, both at sea and on the coast, especially between the south-eastern coast of Spain and Africa, where this occurs on from 14 to 20 days per month from June to August.

The following is from reports from H.M.S. *Endeavour* on two sandstorms experienced at the end of November, 1930, off the northern coast of Africa, whilst on passage from Gibraltar to Malta:—At the commencement of the first storm, between Cape Ivi and Algiers, at 1300, an orange-coloured haze was observed over the hills ahead about 11 miles away; within half an hour it was over the ship, and one-quarter of an hour later the sun was obscured. As the sand-clouds approached, the sun faded to pale blue in colour, and the sea became a hard metallic blue, this colouring lasting until the sun was wholly obscured. At 1400, with the exception of strips above the horizon

westward, northward and eastward, the whole sky was covered by sand-clouds, estimated to be at a height of 2,000 feet (609^m6), and it became too dark to read without artificial light between decks ; half an hour later, the colour of the sky was an orange-brown, except to southward, where it was an opaque grey-brown. At 1600, sand began to fall on board the ship, but there was no appreciable deposit until half an hour later, when the visibility was only about 2 miles, and half an hour before sunset it was quite dark. At 1645, a slight rain, accompanied by heavy deposits of very fine yellow-brown mud, began, and continued for about three-quarters of an hour.

A curious phenomenon, apparently caused by the orange-coloured light, was that white and pale yellow objects appeared blue ; the sky immediately above the horizon, below the sand-cloud, appeared a bluish white.

The storm lasted for 7½ hours, during which time the wind was from between south-south-west, the direction from which it began, and west.

The second storm was experienced off Cap Bougaroun, but was much slighter and of shorter duration. The same phenomena as regards the blue colour of the sun and sea were again observed during the first stages of the storm.

Temperature and humidity.—The summers in this region are dry and hot, and the winters for the most part mild.

The annual mean temperature is nearly everywhere between 60° and 65° F.

August is generally the hottest month, but in some places, e.g. at Tunis and Malta, July is equally hot. In August the mean is between 75° and 80°, and in that month, during the daytime, temperature rises on an average well over 80°. The average level reached at a particular place is much affected by the degree of exposure to the sea breeze, e.g. at Palma, which is somewhat sheltered, the average reached is several degrees higher than at the more exposed Puerto de Mahón. On the African coast a vigorous sea breeze keeps the average daily maximum below 85° in most places, but at Tunis, where the breeze is not so much felt, it is well above 90°. As is shown by the extremes given in the climatic tables on pages 49 to 61, temperature has on occasion risen to between 110° and 120° on the African coast and in Sicily. These exceptionally high readings are associated with the wind known as the Scirocco (*see* page 40). The average figure to which temperature falls at night in August is in most places in the western part of the region between 60° and 70°, but is as high as 72° at Bizerta, 73° at Malta and 76° at Messina and Syracuse.

January is generally the coldest month, but there is little difference between January and February. In January mean temperature is about 55° at Gibraltar, but at most places is between 50° and 53° ; at Barcelona it is only 47°. Temperature has fallen below 32° in exceptionally cold weather in winter on the Spanish and African coasts ; in January, 15° has been reached at Barcelona, 26° at Palma, and 28° at Algiers.

The ordinary diurnal variation of temperature is interrupted at times by a strong scirocco or by thick weather accompanying easterly winds, which make conditions close and muggy ; temperature is then much higher than usual at night, even though it may not rise very high during the day owing to lack of sunshine, and sometimes a high humidity adds to the oppressive feeling. On the African coast, however, abnormal dryness of the air is a feature of the Scirocco, and with it abnormal heat and dustiness. Temperature then frequently rises to

over 100° F. on the coast, and sometimes to 110° or over, while relative humidity falls to less than 20 per cent., vegetation and crops being shrivelled and blackened. Special names used in Tunisia for this wind when it is strong and dusty are "Simoom" and "Chihli."

Large and sudden changes of temperature occur when an offshore wind is replaced by one blowing onshore. In autumn, especially, the Scirocco is frequently brought to an end by the passage of a cold front,

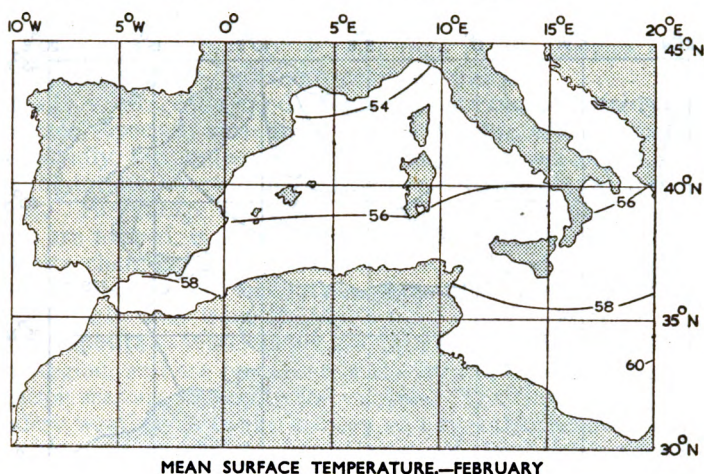


Fig. 4.

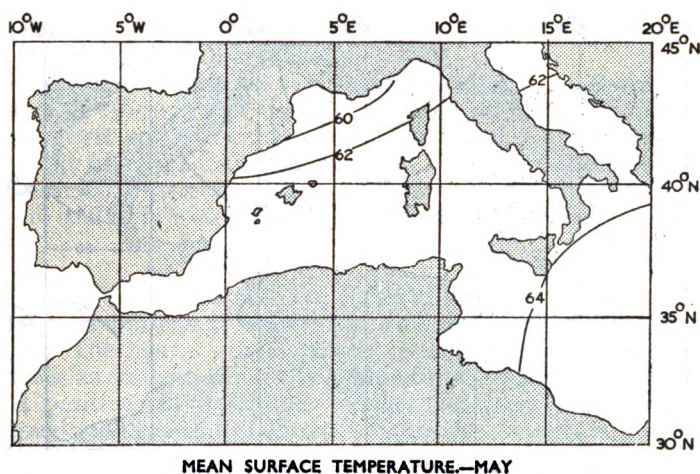


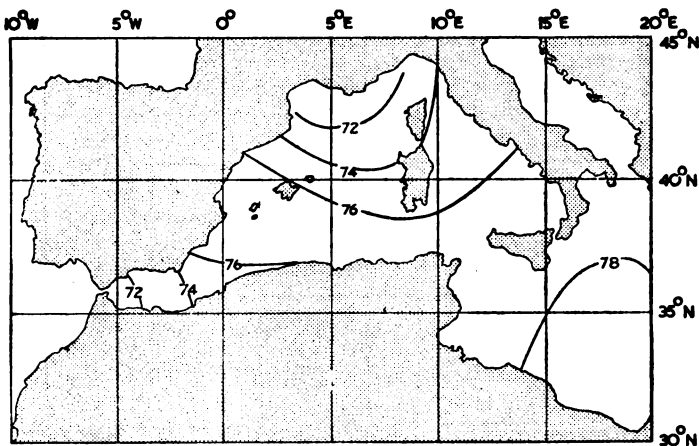
Fig. 5.

when a sudden fall of 20° or more may occur; these sudden chills are very trying.

On the northern coast of Africa, the fresh winds and heavy rains of 10 December and January sometimes make the climate of those months rather chilly and raw, but on that coast and throughout the region covered by this Pilot, temperature rises rapidly in spring.

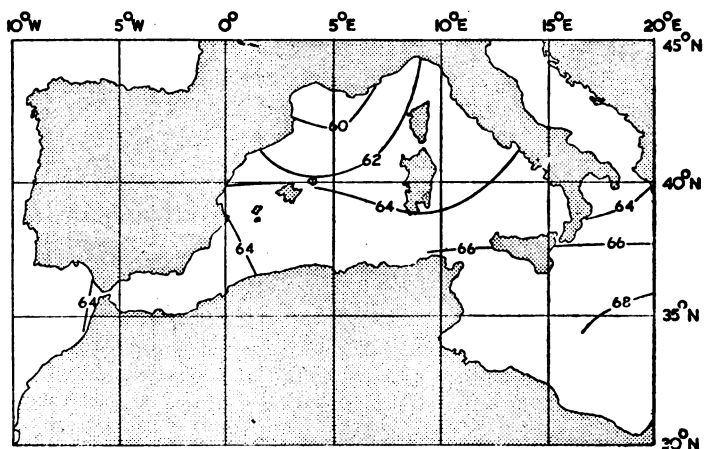
The average relative humidity is generally moderate (between 60 and 80 per cent.) but at Tunis is rather low (between 50 and 60 per cent.) 15 in summer; it is generally highest from November to January and

lowest around July, but with less than 10 per cent. difference between the two seasons westward of about long. 5° E. At most places on the eastern coast of Spain, however, humidity is also low in spring, and this is in some instances the driest season. The variations from one
 5 part of the day to another are much larger than the seasonal changes, notably the fall of humidity with rising temperature after sunrise; day to day variations with changes of wind may also be large, especially on the African coast.



MEAN SURFACE TEMPERATURE.—AUGUST

Fig. 6.



MEAN SURFACE TEMPERATURE.—NOVEMBER

Fig. 7.

Sea temperature.—The average temperature of the sea surface is
 10 lowest in February and highest in August. The general distribution at sea in these months, and in May and November, is shown in Figures 4 to 7. From January to April the temperature at a particular point is very rarely as much as 3° above or below the monthly mean at that point, but from June to October may be 4° or 5° above or below the
 15 mean, and north-eastward of Islas Baleares in September and October as much as 7° above or below it.

Near the north-eastern coast of Spain the temperature from autumn

to spring is several degrees cooler than it is 20 miles or more from the coast, averaging from 45° F. to 47° F. close inshore in February, and about 57° in May and November.

Although the average difference between the temperature of the sea surface and that of the air overlying it is generally not more than 2° or 3°, on individual days it may be considerable. It is very dependent on the strength and direction of the wind, and in the case of offshore winds on the distance from the coast. The greatest differences occur in spring and early summer when the Scirocco is blowing, and the air may then be more than 10° warmer than the sea surface along the shipping route off the northern coast of Africa.

Mirage.—Mirage (*see* standard article, page xxxvii) is of fairly frequent occurrence, especially close inshore in the morning, when temperature is rising rapidly, but large-scale convection has not yet begun, and also when the surface layers of hot winds from the land are being cooled by the sea. The mirage known as “Fata Morgana,” in which multiple images are formed, is very prone to occur in Stretto di Messina. In the Malta channel mirage occasionally occurs, and is responsible for such cases of abnormal visibility as those in which buildings in Sicily can be clearly seen from Malta.

Waterspouts.—Waterspouts are most frequent in the western part of the region, and are numerous in the Strait of Gibraltar during the transition seasons, especially the autumn. They usually occur during thundery weather, or in the vicinity of actual thunderstorms, and are said always to accompany the setting in of the “Vendavales.” The most numerous observations of spouts are associated with the areas off the salient points of the Spanish coast, such as Cabo de Gata, and near Islas Baleares; spouts are observed less frequently farther eastward along the African coast, but they have been known at times to cause considerable damage locally.

Las Tascas.—These are sea waves which occur at Barcelona and in Bahía de Alicante and Golfo de Valencia without wind; they are directly attributable to storms over the open sea. At Barcelona, they precede by about 24 hours strong winds from north-eastward or east-north-eastward associated with such storms. In Golfo de Valencia they are said to be a sign of easterly wind, and at Alicante of northerly wind.

CLIMATIC TABLES.—The tables that follow give statistics for several land stations at which there is a regularly reporting weather station. The figures given are averages, percentage frequencies, or extremes, as stated; it must be realised that these values refer to the actual positions in which the weather has been observed and not necessarily to the open sea or to the approaches to ports in the vicinity. The tables for land stations should therefore be consulted with discretion, especially as regards wind, visibility, cloud, temperature and humidity, since all these elements are probably affected, sometimes a great deal, by local conditions. The following notes indicate ways in which conditions in the open sea may be different from those at the nearest reporting station for which a table is published.

(1) Temperatures over the sea are less extreme, or show smaller departures from the mean, than those over the land. In the night and early part of the day, it is usually warmer over the sea than at a land station, but in the afternoon it is generally cooler over the sea.

(2) Since rainfall at most of the coastal stations in this region is partly orographic, the figures given are not representative of rainfall

at sea in the vicinity. In general, rainfall is smaller at sea than on the coast, especially during the summer.

(3) Cloud amount, which in this region is very variable, is only broadly representative of the state of the sky at sea. In summer the amount is generally less at sea than on the coast during the day, but slightly greater at sea than on the coast at night.

(4) Wind speed is nearly always greater at sea than on the coast, and there may be twice the number of gales at sea than are experienced at a shore station unless it is exceptionally well exposed on, for example, a headland or small low-lying island. Wind direction is affected as explained under "Local modification of the weather near the coast," page liii.

(5) The figures for fog or poor visibility at inland stations or sheltered harbours are no guide to conditions at sea and in the approaches to ports (*see* under "Fog," page 43). When there is fog on the coast, visibility is often good at sea.

PLACE—GIBRALTAR. LAT. 36° 06' N., LONG. 5° 21' W. Height above Mean Sea Level, 90 feet. §
Climatic Table compiled from 4 to 78 Years' Observations, 1852 to 1948.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE Mean of			Relative humidity	SKY† No. of days	RAIN No. of days with 0.04 in. or more fall	WIND DIRECTION																		No. of days with wind of force 8 or more (Beaufort Scale)	No. of days with visibility less than half a sea mile		
		Mean		Mean wind speed				0700									1300												
		Daily max.	Daily min.					Percentage of observations from									Percentage of observations from												
								Highest in each month	Lowest in each month	0700 1300									0700 1300										
										N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.			NW.	Calm
January	mb. 1021	61	49	55	% 82	7	in. 4.5	2	28	6	4	1	8	23	21	8	0	4	30	8	4	12	20	15	1	10	0.2		
February	1020	62	50	56	82	8	4.5	2	28	6	4	1	10	24	19	9	0	26	9	4	16	24	16	1	9	0.2			
March	1017	64	51	57	82	4	4.7	2	31	4	4	2	15	22	15	7	0	32	9	4	15	27	10	1	7	0.1			
April	1016	68	54	61	82	6	2.7	1	16	4	4	5	18	23	13	9	0	22	9	4	22	25	13	2	10	0.1			
May	1016	73	58	65	80	7	1.6	1	21	4	4	5	17	24	11	14	0	19	8	6	24	27	7	3	6	0.3			
June	1017	78	63	70	80	10	0.5	0	26	9	4	5	16	17	4	12	0	25	11	7	29	17	3	1	6	0.5			
July	1017	83	67	75	80	18	0	0	33	9	4	5	15	15	5	13	0	39	10	7	26	13	1	0	6	0.5			
August	1017	84	69	81	80	18	0	0	37	5	5	6	13	15	6	13	0	40	6	9	23	11	4	0	6	0.5			
September	1017	79	64	71	82	9	1.3	1	37	2	5	6	13	18	5	14	0	43	6	9	23	14	2	0	7	0.2			
October	1017	73	60	66	83	9	3.3	6	4	37	5	2	11	16	13	16	1	37	5	3	21	16	20	1	11	0.3			
November	1018	66	54	73	83	8	6.4	10	4	3	21	4	15	22	19	10	1	25	5	3	21	20	15	1	9	0.1			
December	1020	62	50	56	83	11	5.4	3	4	18	3	1	14	23	26	8	1	23	3	4	18	25	21	3	9	0.1			
Means	1018	71	58	64	82	—	—	2	3	27	5	3	14	21	14	11	0	31	8	6	21	21	9	1	8	—			
Totals	—	—	—	—	—	40	35.1	68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
No. of years' observations	76	78	68	68	20	4	79	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10		

Standard of time—G.M.T.

‡ 53 feet before 29th May, 1929.

† Observations from North Point, 36° 09' N., 5° 21' W., 11 feet.

* Mean of highest each year.

** Mean of lowest each year.

†† Lowest recorded temperature.

† Highest recorded temperature.

Authorities:—MS. data at M.O.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—BARCELONA. LAT. 41° 23' N., LONG. 2° 10' E. Height above Mean Sea Level, 136 feet.
Climatic Table compiled from 3 to 30 Years' Observations, 1901 to 1930.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			SKY No. of days	RAIN No. of days with 0.04 in. or more	WIND DIRECTION																		Mean wind speed	No. of days with wind of force 8 or more	No. of days with visibility less than one sea mile	
		Daily max.	Daily min.	Highest in each month			Lowest in each month	Relative humidity		Percentage of observations from																		
								0700	1300	0700						1300												
										Percentage of observations from																		
										Percentage of observations from																		
										N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.				W.
January . . .	1019	56	42	65	33	75	62	12	7	1.3	6	21	30	12	11	6	3	1	3	15	22	14	25	4	7	0.1	6	
February . . .	1017	58	43	67	35	72	60	9	8	1.7	5	18	27	17	5	12	7	3	6	17	17	8	20	6	8	0.3	5	
March . . .	1015	61	46	70	38	74	63	9	9	1.8	6	14	17	24	6	11	10	6	18	31	8	3	7	5	9	0	6	
April . . .	1014	64	49	73	42	69	61	6	10	1.7	8	9	15	32	5	13	12	7	25	23	5	2	9	8	9	0	4	
May . . .	1015	70	55	81	48	61	63	9	9	1.5	5	6	8	34	4	13	12	7	26	27	1	1	9	4	9	0	4	
June . . .	1017	77	62	85	55	67	63	9	8	1.5	6	6	6	43	2	12	11	11	23	27	1	1	0	6	4	9	0	4
July . . .	1017	81	67	89	61	67	63	13	4	1.3	4	11	5	6	4	6	10	13	38	22	4	1	0	6	4	9	0	4
August . . .	1017	83	68	90	61	71	65	11	5	1.3	4	7	5	5	5	7	9	14	34	19	6	2	12	4	8	0	3	
September . . .	1017	78	63	84	54	74	66	8	9	1.3	4	3	10	11	36	6	13	12	24	19	6	2	11	4	7	0	3	
October . . .	1016	71	47	79	47	76	86	8	9	2.4	7	3	11	21	27	9	11	7	31	22	13	5	11	4	7	0	1	
November . . .	1016	63	49	72	40	79	63	8	9	2.3	8	2	12	25	20	12	7	4	11	17	13	6	14	25	5	7	0	4
December . . .	1017	58	44	68	36	75	62	9	8	1.7	5	6	16	31	13	15	6	1	2	10	17	20	27	6	7	0	1	
Means . . .	1016	68	54	—	—	72	64	—	—	—	21	7	4	2	3	6	11	18	28	6	10	8	6	15	5	8	—	—
Totals . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations . . .	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	10	30	30	30	30	30	30	30	30	10

Standard of time—G.M.T.

* Mean of highest each year.

** Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

Authorities :—MS. data supplied by Servicio Meteorológico Nacional, Madrid.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—PALMA. LAT. 39° 34' N., LONG. 2° 39' E. Height above Mean Sea Level, 93 feet.
Climatic Table compiled from 16 to 30 Years' Observations, 1901 to 1935.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE		Relative humidity %	SKY No. of days	RAIN No. of days with Average fall	WIND DIRECTION												Mean wind speed (Mean of 24 hrs.)	No. of days with wind of force 8 or more	No. of days with visibility less than half a sea mile								
		Daily max.	Daily min.				Percentage of observations from						Percentage of observations from																
							Highest in each month	Lowest in each month	F.	F.	F.	F.	S.	SW.	W.	NW.	Calm	N.				NE.	E.	SE.	S.	SW.	W.	NW.	Calm
0700 1300		Clear less than 2/10	Cloudy more than 8/10	0-4 in. or more	0700 %						1300 %																		
mb.	F.	F.	F.	%	8	6	in.	58	13	1	0	1	3	7	9	11	0	29	14	5	1	3	25	12	11	0	4	1	2
January	1021	57	43	65	36	76	69	1.4	5	3	1	0	1	3	8	13	12	0	29	14	5	1	4	31	14	10	1	5	0
February	1019	59	45	67	39	75	68	1.5	6	3	1	1	3	11	13	11	9	1	15	10	6	1	7	37	13	6	0	4	1
March	1017	61	46	70	39	76	66	1.5	6	7	1	1	3	12	10	9	0	15	12	7	1	9	48	9	4	0	4	0	1
April	1014	66	50	76	42	72	64	1.4	4	20	4	0	7	19	5	6	0	8	9	6	2	12	53	6	2	0	4	0	0.5
May	1017	73	55	83	48	70	66	1.4	4	26	24	0	10	21	5	4	0	7	6	5	1	12	65	5	2	0	4	0	0.5
June	1017	79	62	89	55	69	65	1.3	2	24	25	10	2	9	5	3	0	4	6	5	1	8	63	5	2	0	4	0	0.5
July	1018	87	93	62	69	65	18	1	0.3	21	29	11	2	9	4	5	0	4	5	8	2	9	47	5	2	0	4	0	0.1
August	1018	86	69	94	63	71	67	10	0.6	33	28	12	1	6	13	4	0	4	14	6	3	8	37	10	7	0	4	0	0.1
September	1018	81	64	87	67	75	69	10	3	44	27	8	1	2	8	5	7	0	16	12	6	3	37	10	7	0	4	0	0.1
October	1017	58	53	82	50	77	70	9	4	26	6	4	1	1	8	12	10	0	29	12	6	3	26	14	8	0	5	0	0.1
November	1017	64	51	72	42	77	70	6	2.3	48	15	4	1	1	7	10	0	29	12	6	3	26	14	8	0	5	0	0.1	
December	1018	60	46	67	38	73	71	6	22.1	47	13	1	1	1	10	15	12	0	27	14	3	1	27	14	11	0	4	0	0.5
Means	1018	70	55	—	—	73	68	—	39	21	6	1	4	12	9	8	0	15	11	6	1	7	44	10	6	0	4	—	—
Totals	—	—	—	—	—	—	49	189	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30

§ Hours of observation—0600 and 1800 till 1911 then 0700, 1300 and 1800.

•• Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

• Mean of highest each year.

Authorities :—MS. data supplied by Servicio Meteorológico Nacional, Madrid.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—PUERTO DE MAHÓN. LAT. 39° 52' N., LONG. 4° 14' E. Height above Mean Sea Level, 141 feet.
Climatic Table compiled from 10 to 31 Years' Observations, 1901 to 1949.

MONTH	PRES- SURE at M.S.L., Mean	AIR TEMPERATURE Mean of		Relative humidity	SKY No. of days	RAIN Average No. of days with 0.04 in. or more	WIND DIRECTION												Mean wind force or speed	No. of days with force 8 or more	No. of days with visibility less than half a sea mile †									
		Daily max.	Daily min.				0700						1300																	
							Percentage of observations from						Percentage of observations from																	
							N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.				SE.	S.	SW.	W.	NW.	Calm			
January	1020	56	46	63	37	81	70	%	6	8	2	1	2	8	10	13	13	48	9	5	1	2	15	5	14	1	11	15	0.7	
February	1017	57	46	65	38	79	67	%	5	5	2	4	4	9	13	19	14	52	9	3	9	4	18	14	11	0	11	15	0.7	
March	1015	60	48	70	40	78	68	%	5	10	6	6	6	17	10	13	13	33	20	4	12	3	19	4	5	0	10	15	0.8	
April	1014	63	51	74	44	73	64	%	4	19	4	4	7	15	9	10	20	17	11	2	17	12	28	3	10	0	8	11	0.3	
May	1016	70	57	81	48	71	63	%	3	24	5	9	6	13	6	9	16	27	23	5	18	8	15	2	2	0	8	10	0.1	
June	1017	76	63	87	56	66	59	%	2	20	14	9	10	10	16	5	8	8	19	21	10	25	7	14	2	1	1	8	10	0.1
July	1017	81	68	90	62	62	56	%	2	32	17	7	6	4	9	2	8	15	30	26	7	18	6	11	1	1	0	8	11	0.8
August	1017	82	70	92	63	66	58	%	1	19	16	8	10	8	7	3	9	20	23	21	5	21	10	15	2	2	1	7	10	0
September	1017	77	66	86	57	67	61	%	2	21	11	5	8	7	10	8	12	18	12	18	7	30	11	11	3	5	1	8	13	0.3
October	1016	71	60	80	51	75	66	%	4	24	10	2	7	5	9	8	19	19	26	13	3	13	11	17	5	11	1	8	12	0.3
November	1016	63	53	72	44	78	69	%	4	17	8	4	5	4	15	9	19	19	23	9	2	6	9	24	13	13	1	7	12	0.2
December	1017	58	48	65	39	79	70	%	6	17	6	2	6	3	18	14	22	12	30	2	0	1	7	29	17	12	2	10	13	0.9
Means	1017	68	57	94*	35**	73	64	%	24	10	5	6	6	12	8	14	15	27	15	4	14	8	18	6	7	1	9	12	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	30	31						14	10						30						13		5							

† At 0700 only.

Standard of time = G.M.T.

** Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

* Mean of highest each year.

Authorities :—Madrid, Resumen de las obs.
Madrid, Boletín del Servicio Meteorológico Español,

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—CAGLIARI (ELMAS). LAT. 39° 13' N., LONG. 9° 06' E. Height above Mean Sea Level, 246 feet.
Climatic Table compiled from 3 to 39 Years' Observations, 1879 to 1938.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			Relative humidity	SKY \$ No. of days	RAIN		WIND DIRECTION												Mean wind speed	No. of days with wind of force 8 or more	No. of days with visibility less than half a sea mile †			
		Daily max.	Daily min.	Highest in each month			Lowest in each month	Clear less than 2/10	Cloudy more than 8/10	Average fall	No. of days with 0.04 in. or more	0800						1900								
												Percentage of observations from														
												Percentage of observations from						Percentage of observations from								
												N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.
January	mb.	55	43	63	35	37	89	78	%	82	%	89	78	%	82	%	89	78	%	82	%	89	78	%	0.4	
February	1016	57	44	64	38	38	88	77	%	81	%	88	77	%	81	%	88	77	%	81	%	88	77	%	0.2	
March	1014	61	47	69	43	43	84	73	%	78	%	84	73	%	78	%	84	73	%	78	%	84	73	%	0.2	
April	1014	65	50	73	48	47	82	71	%	71	%	82	71	%	71	%	82	71	%	71	%	82	71	%	0.2	
May	1016	72	54	81	54	48	80	66	%	64	%	80	66	%	64	%	80	66	%	64	%	80	66	%	0.2	
June	1016	80	61	89	60	44	86	59	%	54	%	86	59	%	54	%	86	59	%	54	%	86	59	%	0.2	
July	1016	87	66	96	64	33	94	61	%	33	%	94	61	%	33	%	94	61	%	33	%	94	61	%	0.2	
August	1016	86	67	94	61	27	92	64	%	27	%	92	64	%	27	%	92	64	%	27	%	92	64	%	0.4	
September	1017	81	64	89	56	0.7	82	73	%	11	%	82	73	%	11	%	82	73	%	11	%	82	73	%	0.6	
October	1016	73	58	81	49	1.4	85	77	%	4	%	85	77	%	4	%	85	77	%	4	%	85	77	%	0.6	
November	1016	64	52	72	42	2.8	80	85	%	6	%	72	42	%	6	%	72	42	%	6	%	72	42	%	0.4	
December	1016	57	45	64	37	2.2	80	85	%	6	%	64	37	%	6	%	64	37	%	6	%	64	37	%	0.4	
Means	1016	70	54	97*	32**	—	84	74	%	74	%	97*	32**	%	74	%	97*	32**	%	74	%	97*	32**	%	—	
Totals	—	—	—	—	—	18.1	—	—	—	60	—	—	—	—	59	—	—	—	—	—	—	—	—	—	—	
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. of years' observations	29	15	15	16	16	3	3	3	3	4	4	4	4	4	39	10	5	5	5	5	5	5	5	5	5	

* At 0700 only. † At 0700 only. ‡ Standard of time—15° E. meridian.
§ Observations at 39° 14' N., 9° 08' E.
|| Mean of highest each year. ¶ Mean of lowest each year.

Authorities:—MS. data supplied by R. Ufficio Centrale di Meteorologia e Geodinamica, Rome.
Eredia F. La Variazione diurna del la temp. in Italia.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—ORAN. LAT. 35° 44' N., LONG. 0° 39' W. Height above Mean Sea Level, 36 feet.
Climatic Table compiled from 5 to 30 Years' Observations, 1884 to 1947.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of		Relative humidity	SKY [†] No. of days	RAIN Average No. of days with 0.04 in. or more fall	WIND DIRECTION												No. of days with wind of 34 knots or more	No. of days with visibility less than half a sea mile [‡]									
		Daily max.	Daily min.				0700						1300																
							Percentage of observations from																						
							0700						1300																
							N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm					
January	mb.	60	48	69	72	42	77	67	64	9	6	6	10	10	3	58	7	12	1	0	6	21	17	8	23	6	0	2	
February	1021	62	50	72	47	48	77	67	64	9	6	6	10	10	3	58	7	12	1	0	6	21	17	9	12	5	0	0	
March	1016	65	52	77	47	48	77	67	64	9	6	6	10	10	3	58	7	12	1	0	6	21	17	9	12	5	0	0	
April	1015	69	55	81	48	53	75	66	10	5	1	1	8	8	2	42	19	9	1	4	4	28	17	9	12	5	0	0	
May	1015	73	60	79	53	62	72	62	12	4	1	1	17	17	3	34	25	6	1	1	1	20	17	21	3	4	0	0	
June	1016	77	65	90	60	73	68	13	3	0	1	1	18	17	3	39	32	6	0	0	2	12	21	32	3	4	0	0	
July	1015	82	70	93	68	19	72	13	3	0	1	1	11	11	2	38	44	2	0	0	6	13	38	1	5	12	0	0	
August	1015	84	72	96	68	19	72	13	3	0	1	1	11	11	2	38	44	2	0	0	6	13	38	1	5	12	0	0	
September	1016	80	68	92	62	73	69	12	4	1	1	1	9	9	0	60	45	4	1	0	2	9	7	38	0	3	12	0	
October	1016	74	61	84	55	77	66	8	6	4	1	1	12	12	1	71	32	10	4	1	4	29	21	12	16	3	9	0	
November	1017	67	56	77	66	8	66	8	6	4	1	1	17	12	1	60	14	4	0	1	4	29	21	12	16	3	8	0	
December	1020	62	49	71	44	7	66	9	5	1	1	1	26	9	2	51	6	6	1	0	6	38	18	4	5	0	0	1	
Means	1017	71	59	100*	40**	—	68	—	—	—	—	—	11	2	53	25	7	1	0	3	18	14	24	8	4	10	—	11	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	30	25	25	25	25	10	26	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	5	5	7-8	—	

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature } in 21 years.
‡ Lowest recorded temperature }
§ Estimated.
¶ At 0700 only.

Standard of Time=G.M.T.

Authorities:—Seltzer, P. et Alii, Le Climat de l'Algérie, Algiers.
Algers, Bull. mens. Algérie du Nord.
Paris, Annales du Bureau Central Météor. de France.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—ALGIERS. LAT. 36° 46' N., LONG. 3° 3' E. Height above Mean Sea Level, 194 feet.
Climatic Table compiled from 7 to 26 Years' Observations, 1913 to 1939.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE Mean of		Relative humidity	SKY% No. of days		RAIN		WIND DIRECTION										Mean wind speed	No. of days with No. of 34 knots or more	No. of days with visibility less than half a sea mile										
		Daily max.	Daily min.		Highest in each month	Lowest in each month	Clear 2/10 or less	Cloudy 8/10 or more	Average fall	No. of days with 0.04 in. or more	0700					1300															
											Percentage of observations from																				
											N.	N. NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
January	mb. 1020	59	49	67	41	% 66	7	7	in. 4.5	5	3	1	1	2	15	25	9	39	11	12	8	1	2	16	23	9	15	6	8	1	0.4
February	1018	61	49	72	43	72	6	8	3.3	2	3	0	1	3	18	24	7	38	10	14	7	1	2	13	25	9	10	6	9	0	0.4
March	1016	63	52	76	47	67	5	6	2.9	3	5	0	2	17	23	5	39	10	22	2	3	3	3	12	23	8	9	9	0	0.6	
April	1015	68	55	83	53	67	9	8	1.6	5	10	3	0	2	14	18	4	41	15	25	6	2	3	8	23	3	10	6	0.3		
May	1015	73	59	88	53	72	60	12	0.6	2	8	1	0	9	13	5	44	20	22	5	1	1	4	23	4	9	0.5	4	0.4	0.1	
June	1016	78	65	91	59	72	60	18	0.4	5	10	3	0	2	6	10	3	49	27	26	7	0	0	1	12	10	4	4	8	0.3	
July	1016	83	70	97	67	80	18	2	0.5	8	20	5	1	3	6	8	4	57	27	42	7	0	0	1	11	8	4	4	8	0.4	
August	1016	85	71	99	67	74	10	5	1.6	4	8	4	2	9	10	6	65	23	30	10	1	1	0	8	21	3	7	6	9	0.1	
September	1016	81	69	94	61	72	60	8	3.1	7	5	2	0	2	15	19	6	49	19	23	6	1	3	13	23	11	8	4	8	0.1	
October	1016	74	63	85	58	63	6	9	5.1	11	3	3	1	0	20	24	8	38	6	13	6	1	3	19	33	9	5	7	1	0	0.1
November	1016	66	56	78	48	72	63	6	5.3	12	3	3	0	3	23	24	7	37	5	9	4	1	3	19	33	9	17	6	9	1	0
December	1020	60	51	69	41	72	64	6	5.3	12	3	3	0	3	23	24	7	37	5	9	4	1	3	19	33	9	17	6	9	1	0
Means	1017	71	59	102*	38**	72	61	—	76	4	7	3	0	2	14	19	6	45	16	23	6	1	2	9	22	12	9	5	8	—	2
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	26	25	25	25	10	10	25	17	10										10	10	10	7-8									

§ Estimated.

Standard of Time = G.M.T.

¶ At 0700 only.

** Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

* Mean of highest each year.

Authorities:—Algers, Service Météorologique, Bull mens. de l'Institut de Météorologie et Physique du Globe de l'Algérie.
Seltzer, P. et Alii, Le Climat de l'Algérie, Algiers.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—BIZERTA. LAT. 37° 16' N., LONG. 9° 48' E. Height above Mean Sea Level, 12 feet.

Climatic Table compiled from 5 to 28 Years' Observations, 1887 to 1936.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			SKY No. of days	RAIN No. of days with Average fall	WIND DIRECTION																Mean wind speed	No. of days with wind of force 8 or more	No. of days with visibility less than half a sea mile								
		Daily max.	Daily min.	Highest in each month			Lowest in each month	Relative Humidity	Percentage of observations from								Percentage of observations from																
									0800				1400				0800				1400					0800				1400			
									N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.		NW.	Calm	N.	NE.	E.	SE.	S.	SW.
January	1018	58	46	65	40	75	%	in.	13	7	2	1	2	4	16	19	15	34	9	3	3	5	6	7	14	23	19	18	8	12	0	0	
February	1017	59	47	69	42	72	%	in.	11	4	2	3	6	11	22	11	36	7	5	6	6	8	17	17	23	13	12	9	14	2	0		
March	1015	63	50	76	42	72	%	in.	5	1	2	3	5	12	20	15	43	7	7	10	11	8	8	20	22	8	8	15	1	0	0		
April	1014	67	53	79	46	70	%	in.	3	1	2	3	3	9	26	17	26	13	15	7	3	1	5	25	31	7	7	8	0	0	0		
May	1015	73	59	84	51	68	%	in.	3	1	3	3	1	6	21	20	35	17	20	6	3	1	0	17	34	2	4	8	0	0	0		
June	1016	79	65	92	59	64	%	in.	2	3	5	5	2	3	19	20	35	17	20	6	4	0	0	22	31	3	7	14	0	0	0		
July	1016	85	71	99	64	66	%	in.	2	3	5	5	2	3	19	20	35	17	20	6	4	0	0	22	31	3	7	14	0	0	0		
August	1016	85	72	98	67	63	%	in.	2	3	5	5	2	3	19	20	35	17	20	6	4	0	0	22	31	3	7	14	0	0	0		
September	1017	83	69	95	61	67	%	in.	3	1	1	3	6	9	10	4	14	12	44	8	20	7	12	5	3	3	5	13	0	0	0		
October	1016	77	63	90	55	70	%	in.	5	2	1	3	5	4	6	13	17	10	41	7	10	6	7	4	7	27	12	10	6	12	0	0	
November	1017	68	56	78	47	73	%	in.	5	2	1	3	5	4	6	13	17	10	41	7	10	6	7	4	7	27	12	10	6	12	0	0	
December	1017	61	49	67	42	75	%	in.	11	2	3	2	3	5	20	20	10	35	3	3	3	8	7	16	24	12	24	7	11	6	0		
Means	1016	71	58	101*	38**	70	%	in.	—	3	2	4	4	5	11	19	14	38	10	13	6	6	4	7	22	22	10	7	13	—	—		
Totals	—	—	—	—	—	—	%	in.	65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Extreme values	—	—	—	—	—	—	%	in.	25-7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. of years' observations	28	28	28	28	10	28	%	in.	28	10	28	10	28	10	28	10	28	10	28	10	28	10	28	10	28	10	28	10	28	10	28	10	28

† At 0700 only.

* Mean of highest each year.

** Mean of lowest each year.

Standard of time = 15° E. meridian.

† Highest recorded temperature.

†† Lowest recorded temperature.

Authorities:—Tunis, Serv. Mët. Bull. Quot. de l'Afrique du Nord.
Tunis, Service Météorologique.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—TUNIS. LAT. 36° 48' N., LONG. 10° 10' E. Height above Mean Sea Level, 108 feet.
Climatic Table compiled from 4 to 39 Years' Observations, 1887 to 1938.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			Relative humidity	SKY No. of days	RAIN No. of days with 0.04 in. or more	WIND DIRECTION												No. of days with wind of force 8 or more	Mean wind speed	No. of days with visibility less than half a sea mile †				
		TEMPERATURE		Mean of				Percentage of observations from						Percentage of observations from												
		Daily max.	Daily min.					High- est in each month	Lowest in each month	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.				NE.	E.	SE.	S.
		0800	1400	Clear less than 2/10	Cloudy more than 8/10	Average fall	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm		
January . . .	mb. 1019	58	43	67	86	56	7	7	1	2	3	3	4	10	4	15	5	9	3	4	11	25	18	8		
February . . .	1017	60	44	71	89	57	8	8	1	2	3	3	4	12	7	16	6	7	5	6	9	31	19	1		
March . . .	1015	65	47	78	95	57	10	10	1	2	3	3	4	13	7	21	10	13	6	6	11	24	16	1		
April . . .	1014	70	50	85	101	51	18	18	4	0	0	0	0	14	9	16	12	12	1	1	12	10	0			
May . . .	1015	76	56	91	104	45	25	25	8	0	0	0	0	10	14	16	16	16	2	2	1	4	6	0		
June . . .	1016	85	63	101	114	40	35	35	8	3	3	3	3	8	16	19	16	16	6	6	2	4	12	0		
July . . .	1016	91	68	106	120	35	42	42	8	4	4	4	4	6	18	17	17	17	7	7	5	7	11	0		
August . . .	1016	91	68	107	122	31	44	44	4	3	3	3	3	7	18	16	16	16	3	3	5	9	18	1		
September . . .	1017	86	65	100	116	25	5	5	2	2	2	2	2	10	13	15	11	11	7	6	12	23	17	5		
October . . .	1016	78	58	91	107	25	6	6	2	2	2	2	2	11	10	11	8	8	4	4	6	35	21	4		
November . . .	1016	69	51	80	92	31	6	6	0	0	0	0	0	12	4	13	2	1	4	6	12	35	21	4		
December . . .	1017	61	45	70	87	31	7	7	3	4	4	4	4	9	1	16	10	22	6	6	6	18	15	1		
Means . . .	1016	74	55	109*	135**	54	7	7	3	4	4	5	20	36	12	9	16	22	6	6	6	18	15	1		
Totals . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
No. of years' observations	30	35-39	35-39	35-39	10	36	12	14-15												5	4					

Standard of time—15° E. meridian.

* At 0700 only.

* Mean of highest each year.

** Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

Authorities :—Tunis, Serv. Météor. Relevé des Obs. and Résumé Climatologique.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

at sea in the vicinity. In general, rainfall is smaller at sea than on the coast, especially during the summer.

(3) Cloud amount, which in this region is very variable, is only broadly representative of the state of the sky at sea. In summer the
5 amount is generally less at sea than on the coast during the day, but slightly greater at sea than on the coast at night.

(4) Wind speed is nearly always greater at sea than on the coast, and there may be twice the number of gales at sea than are experienced at a shore station unless it is exceptionally well exposed on, for example,
10 a headland or small low-lying island. Wind direction is affected as explained under "Local modification of the weather near the coast," page liii.

(5) The figures for fog or poor visibility at inland stations or sheltered harbours are no guide to conditions at sea and in the approaches to
15 ports (*see* under "Fog," page 43). When there is fog on the coast, visibility is often good at sea.

PLACE—GIBRALTAR. LAT. 36° 06' N., LONG. 5° 21' W. Height above Mean Sea Level, 90 feet. §
Climatic Table compiled from 4 to 78 Years' Observations, 1852 to 1948.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of		Relative humidity	SKY† No. of days	RAIN		WIND DIRECTION												No. of days with wind of force 8 or more (Beaufort Scale)	No. of days with visibility less than half a sea mile							
		Daily max.	Daily min.			Highest in each month	Lowest in each month	No. of days with Average fall 0.04 in. or more	0700						1300													
									Percentage of observations from																			
									Percentage of observations from						Percentage of observations from													
									N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.	N.	NE.			E.	SE.	S.	SW.	W.	NW.	Calm.
mb.	° F.	° F.	%	° F.	° F.	%	° F.	° F.	%	° F.	° F.	%	° F.	° F.	%	° F.	° F.	%	° F.	° F.	%	° F.	° F.	%	° F.	° F.	%	
January	1021	61	49	67	42	58	2	2	2	2	1	1	8	23	21	0	4	30	8	4	12	16	15	1	10	0.2	0.4	
February	1020	62	50	69	43	57	3	3	2	2	1	1	10	24	19	0	2	26	9	4	14	16	15	1	12	0.2	0.4	
March	1017	64	51	71	45	56	4	4	2	2	1	1	13	23	18	0	3	22	8	7	15	16	15	1	10	0	0.1	
April	1016	68	54	76	48	52	4	4	2	2	1	1	17	22	18	0	3	22	8	7	22	19	13	2	7	0	0.1	
May	1016	73	58	81	52	50	2	2	2	2	1	1	19	24	20	0	3	23	11	7	24	27	17	3	6	0	0.3	
June	1017	78	63	87	57	50	0	0	3	3	1	1	16	24	21	0	3	23	11	7	24	27	17	3	6	0	0.3	
July	1017	83	67	90	62	50	0	0	4	4	1	1	13	24	20	0	2	23	10	8	23	13	4	0	6	0	0.3	
August	1017	84	69	91	63	50	0	0	3	3	1	1	12	24	20	0	2	23	10	8	23	13	4	0	6	0	0.3	
September	1017	79	66	87	59	52	1	1	3	3	1	1	15	23	19	0	3	23	10	8	23	13	4	0	7	0	0.4	
October	1017	73	60	81	52	53	3	3	3	3	2	2	16	23	19	1	2	23	6	9	23	13	4	0	8	0	0.4	
November	1018	66	54	73	47	53	4	4	3	3	2	2	15	23	20	1	2	23	5	7	21	18	15	1	8	0.1	0.3	
December	1020	62	50	69	42	58	3	3	4	4	1	1	14	23	20	1	2	23	3	4	18	25	21	3	9	0.1	0.1	
Means	1018	71	58	98*	39**	82	65	119	40	—	—	—	14	21	14	11	0	31	5	6	21	21	9	1	8	10	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	76	78	68	68	20	20	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	10

Standard of time=G.M.T.

§ 53 feet before 29th May, 1929.

† Observations from North Point, 36° 09' N., 5° 21' W., 11 feet.

* Mean of highest each year.

** Mean of lowest each year.

†† Lowest recorded temperature.

† Highest recorded temperature.

Authorities:—MS. data at M.O.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—BARCELONA. LAT. 41° 23' N., LONG. 2° 10' E. Height above Mean Sea Level, 136 feet.
Climatic Table compiled from 3 to 30 Years' Observations, 1901 to 1930.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			Relative humidity	SKY No. of days	RAIN No. of days with 0.04 in. or more	WIND DIRECTION												Mean wind speed	No. of days with wind of force 8 or more	No. of days with visibility less than one sea mile										
		Daily max.	Daily min.	Highest in each month				Lowest in each month	0700						1800																	
									Percentage of observations from						Percentage of observations from																	
									N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.				E.	SE.	S.	SW.	W.	NW.	Calm			
January	mb. 1019	56	42	65	33	75	1.3	5	21	6	1	1	2	6	21	30	12	11	6	3	1	3	15	22	14	25	4	7	8	0.1	6	
February	1017	58	43	67	35	72	1.7	5	22	5	2	0	3	7	18	27	17	5	12	7	3	11	17	17	8	20	6	6	8	0.2	5	
March	1015	61	46	70	38	74	1.8	7	24	9	4	0	3	8	14	17	24	6	11	10	6	18	31	8	3	7	5	9	0	3	4	
April	1014	64	49	73	42	69	1.7	8	16	10	5	3	6	9	9	15	32	5	14	16	8	16	26	7	0	8	4	4	0	4	4	
May	1015	70	55	81	48	61	1.5	5	13	9	8	2	6	6	8	9	34	4	13	12	7	25	23	5	2	9	4	9	0	4	4	
June	1017	77	62	85	55	67	1.4	4	16	10	5	3	6	6	6	6	44	2	12	11	11	26	27	1	1	9	4	9	0	4	4	
July	1017	81	67	89	61	67	1.1	4	12	7	6	4	4	7	11	5	43	1	6	10	13	38	22	4	0	6	4	7	0	2	4	
August	1017	83	68	90	61	71	1.3	4	25	5	5	1	4	6	7	11	36	6	13	12	7	34	19	6	2	12	4	4	8	0	2	4
September	1017	88	73	94	54	74	1.4	8	27	3	2	1	1	1	3	10	17	36	6	13	12	7	24	19	6	2	11	4	8	0	1	3
October	1016	71	47	79	47	76	1.3	8	26	6	3	2	2	1	3	11	21	27	9	11	7	3	11	22	13	5	19	3	7	0	4	4
November	1016	63	49	72	40	79	1.2	5	28	5	2	2	2	4	12	25	20	12	7	4	1	4	17	16	14	25	5	5	0	5	0	5
December	1017	58	44	68	36	75	1.7	5	23	5	2	1	3	6	16	31	13	15	6	4	2	2	10	17	20	27	6	7	0	1	5	
Means	1016	68	54	—	—	72	—	—	21	7	4	2	3	6	11	18	28	6	10	8	6	18	21	10	6	15	5	8	—	—	—	
Totals	—	—	—	—	—	—	22.4	72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	97†	24†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	30	30	30	30	30	15	30	30	30	30	30	30	30	30	30	30	10	30	30	30	30	30	30	30	30	30	30	30	30	30	10	10

Standard of time = G.M.T.

** Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

* Mean of highest each year.
Authorities :—MS. data supplied by Servicio Meteorológico Nacional, Madrid.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—PALMA. LAT. 39° 34' N., LONG. 2° 39' E. Height above Mean Sea Level, 93 feet.
Climatic Table compiled from 16 to 30 Years' Observations, 1901 to 1935.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE				Relative humidity %	SKY No. of days	RAIN No. of days with fall	WIND DIRECTION												No. of days with force 8 or more	Mean wind speed (Mean of 24 hrs.)	No. of days with visibility less than half a sea mile																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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mb.	° F.	° F.	° F.	° F.	%	8	6	in.	58	13	1	0	1	3	7	9	11	0	29	14	5	1	3	25	12	11	0	knots	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

§ Hours of observation = 0600 and 1800 till 1911 then 0700, 1800 and 1800.

•• Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

• Mean of highest each year.

Authorities:—MS. data supplied by Servicio Meteorológico Nacional, Madrid.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—PUERTO DE MAHÓN. LAT. 39° 52' N., LONG. 4° 14' E. Height above Mean Sea Level, 141 feet.
Climatic Table compiled from 10 to 31 Years' Observations, 1901 to 1949.

MONTH	PRES- SURE at M.S.L., Mean	AIR TEMPERATURE Mean of			Relative humidity	SKY No. of days	RAIN		WIND DIRECTION												Mean wind force or speed	No. of days with wind of force 8 or more	No. of days with visibility less than half a sea mile †									
		Daily max.	Daily min.	Highest in each month			Lowest in each month	Average fall	No. of days with 0.04 in. or more	Percentage of observations from						Percentage of observations from																
										N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.				E.	SE.	S.	SW.	W.	NW.	Calm		
January	1020	56	46	63	37	81	70	%	%	45	6	2	2	1	2	8	10	13	13	48	9	5	1	2	15	5	14	1	11	15	0.7	0.7
February	1017	57	46	65	38	79	67	%	%	29	6	4	4	6	6	9	13	19	14	32	9	3	9	4	18	14	11	0	11	15	2	1
March	1015	60	48	70	40	78	68	%	%	22	6	5	5	6	7	17	10	13	13	33	20	4	12	3	19	4	5	0	10	15	0.8	2
April	1014	63	51	74	44	73	64	%	%	19	10	4	6	6	7	15	9	10	20	17	11	2	17	12	28	3	10	0	8	11	0.8	3
May	1016	70	57	81	48	71	63	%	%	24	12	5	9	9	6	13	6	9	16	27	23	5	18	8	15	2	2	0	8	10	0.1	0.9
June	1017	76	63	87	56	66	59	%	%	20	14	9	10	10	16	5	8	8	15	19	21	7	18	6	11	1	1	0	8	11	0	0.8
July	1017	81	68	90	62	62	56	%	%	32	17	7	6	4	9	2	5	8	15	30	26	7	18	6	11	1	1	0	8	11	0	0.9
August	1017	82	70	92	63	66	53	%	%	19	16	8	10	8	7	3	9	20	23	21	5	21	10	15	2	2	1	7	10	0	0.6	
September	1017	77	66	86	57	67	61	%	%	21	11	5	8	7	10	8	12	18	12	18	7	30	11	11	3	5	3	7	9	0	0.6	
October	1016	71	60	80	51	75	66	%	%	24	10	2	7	5	9	8	19	16	26	13	3	13	11	17	5	11	1	8	13	0.3	0.3	
November	1016	63	53	72	44	78	69	%	%	17	8	4	5	4	15	9	19	19	23	9	2	6	9	24	13	13	1	7	12	0.2	0.3	
December	1017	58	48	65	39	79	70	%	%	17	6	2	6	3	18	14	22	12	30	2	0	1	7	29	17	12	2	10	13	0.9	0.6	
Means	1017	68	57	94*	36**	73	64	%	%	24	10	5	6	6	12	8	14	15	27	15	4	14	8	18	6	7	1	9	12	—	—	
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—	
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	30	31			11	80	30	81	14	10														—		—		—		—		

† At 0700 only.

Standard of time = G.M.T.

** Mean of lowest each year.

†† Lowest recorded temperature.

† Highest recorded temperature.

Authorities :—Madrid, Resumen de las obs.

Madrid, Boletín del Servicio Meteorológico Español,

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—CAGLIARI (ELMAS). LAT. 39° 13' N., LONG. 9° 06' E. Height above Mean Sea Level, 246 feet.
Climatic Table compiled from 3 to 39 Years' Observations, 1879 to 1938.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			Relative humidity	SKY No. of days	RAIN		WIND DIRECTION												Mean wind speed		No. of days with force 8 or more	No. of days with visibility less than half a sea mile							
		Daily max.	Daily min.	each month			Lowest in each month	Average fall	No. of days with 0.04 in. or more	0800						1900						0800			1900						
				Percentage of observations from																											
				0800						1900																					
				N.						NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.					S.	SW.	W.	NW.	Calm	
January	mb. 1017	° F. 55	° F. 43	° F. 63	% 35	69	78	7	20	25	3	3	3	5	2	6	40	14	17	4	3	6	4	9	42	9	9	11	0.8	0.4	
February	1016	57	44	64	37	80	7	17	25	3	3	3	8	2	4	36	16	15	4	3	9	12	4	11	33	7	11	13	3	0.2	
March	1014	61	47	69	38	77	6	15	18	3	3	3	11	2	4	30	16	15	2	2	17	3	8	24	8	9	12	0.6	0.2		
April	1014	65	50	73	43	84	5	12	25	1	1	1	6	2	5	31	14	14	1	2	22	4	6	23	6	8	14	2	0.2		
May	1016	72	54	81	47	82	1	10	25	1	1	1	6	2	5	36	17	18	4	2	4	2	7	26	5	8	15	2	0.2		
June	1016	80	61	86	54	84	1	8	27	2	4	1	6	3	1	4	44	21	13	4	5	23	17	1	3	25	4	8	15	0.2	
July	1016	87	66	94	56	74	0.6	5	27	4	3	3	4	1	4	35	15	15	2	4	24	22	5	3	21	4	8	14	0.8	0.4	
August	1016	85	67	94	61	82	0.7	4	24	4	5	4	4	1	4	38	18	19	4	4	19	12	4	4	25	9	7	11	0.6	0	
September	1017	83	64	89	66	85	7	3	20	4	4	4	7	2	4	32	25	9	2	5	15	13	6	7	25	19	6	8	1	0.6	
October	1016	73	58	81	42	90	8	5	16	3	4	4	9	2	5	32	25	9	2	5	15	13	6	7	25	19	6	8	1	0.6	
November	1016	84	62	72	42	80	9	2	16	3	4	2	2	2	8	35	26	11	4	2	6	6	3	7	32	29	7	9	1	0.4	
December	1016	57	45	64	37	80	6	9	25	3	3	3	5	2	6	35	26	11	4	2	6	6	3	7	32	29	7	9	1	0.4	
Means . . .	1016	70	54	97*	32**	84	—	—	21	3	3	7	3	2	5	37	19	15	3	3	18	14	3	7	28	9	8	12	—	—	
Totals . . .	—	—	—	—	—	—	181	59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	29	15	15	16	16	3	4	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5

* Mean of highest each year.

** Mean of lowest each year.

† At 0700 only.

‡ Highest recorded temperature.

Standard of time = 15° E. meridian.

†† Lowest recorded temperature.

Authorities :—MS. data supplied by R. Ufficio Centrale di Meteorologia e Geodinamica, Rome.
Eredia F. La Variazione diurna del la temp. in Italia.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—ORAN. LAT. 35° 44' N., LONG. 0° 39' W. Height above Mean Sea Level, 36 feet.

Climatic Table compiled from 5 to 30 Years' Observations, 1884 to 1947.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			Relative humidity	SKY [†] No. of days	RAIN		WIND DIRECTION												Mean wind speed		No. of days with visibility less than half a sea mile																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Daily max.	Daily min.	Highest in each month			Lowest in each month	Average fall	No. of days with 0.04 in. or more	Percentage of observations from						Percentage of observations from						0700		1300																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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January	mb. 1021	° F. 60	° F. 45	69	42	° F. 42	78	70	% 78	70	8	in. 2.5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

PLACE—ALGIERS. LAT. 36° 46' N., LONG. 3° 3' E. Height above Mean Sea Level, 194 feet.

Climatic Table compiled from 7 to 26 Years' Observations, 1913 to 1939.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of				Relative humidity	SKYs No. of days	RAIN		WIND DIRECTION										Mean wind speed	No. of days with wind of 34 knots or more	No. of days with visibility less than half a sea mile †										
		Daily max.	Daily min.	Highest in each month	Lowest in each month			0700	1300	Average fall	No. of days with 0.04 in. or more	Percentage of observations from					Percentage of observations from															
												N.	NE.	E.	SE.	S.	SW.	W.	NW.				Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm
January . . .	mb.	° F.	° F.	%	%	° F.	° F.	in.	11	3	1	1	2	15	25	9	39	11	12	8	1	2	16	26	9	15	6	8	1	0.4		
February . . .	1020	59	49	67	41	72	60	4.5	9	2	2	1	3	18	28	7	38	10	14	7	2	2	15	25	17	8	6	9	0.9	0		
March . . .	1018	61	49	72	42	72	61	3.3	9	3	0	0	2	19	24	5	39	10	22	6	2	3	14	23	12	8	6	10	0.9	0		
April . . .	1016	63	52	76	43	71	59	2.9	9	5	3	0	2	17	23	4	41	15	22	5	1	3	8	23	13	4	4	9	0.5	0.6		
May . . .	1015	68	55	83	47	67	57	1.6	5	6	4	0	1	14	18	5	44	20	23	6	0	1	4	26	13	4	4	9	0.4	0.1		
June . . .	1015	73	59	88	53	72	60	1.8	5	10	3	0	2	13	13	3	49	27	26	6	0	0	1	4	21	4	4	4	8	0.4	0.1	
July . . .	1016	78	65	91	59	75	63	0.6	2	13	5	0	3	6	10	3	44	25	42	7	0	0	1	11	16	4	4	4	8	0.6	0.1	
August . . .	1016	83	70	97	65	72	60	<0.1	0	8	20	5	1	6	8	4	57	31	30	10	1	0	1	11	18	4	4	4	8	0.4	0.1	
September . . .	1016	85	71	99	67	70	60	0.2	5	3	4	2	0	6	10	5	65	23	30	6	1	0	5	10	15	6	3	4	7	0.8	0.1	
October . . .	1016	81	69	94	61	74	62	1.6	4	3	5	2	0	19	19	6	49	19	23	6	1	3	13	23	11	9	4	8	0.4	0.1		
November . . .	1016	66	56	78	48	72	60	5.1	11	3	5	2	0	23	24	4	38	6	13	6	1	3	13	23	11	19	5	7	1	0	0	
December . . .	1020	60	51	69	41	72	64	5.3	12	3	0	0	3	23	24	7	37	5	9	4	1	3	19	33	9	17	6	9	1	0	0	
Means . . .	1017	71	59	102*	38**	72	61	—	—	4	7	3	0	2	14	19	6	45	16	23	6	1	2	9	22	12	9	5	8	—	—	—
Totals	—	—	—	—	—	—	—	30.0	76	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	—	2	—
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	26	25	25	25	25	25	25	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	7-8	—

§ Estimated.

Standard of Time = G.M.T.

** Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

* Mean of highest each year.

Authorities :—Algers, Service Météorologique, Bull mens. de l'Institut de Météorologie et Physique du Globe de l'Algérie. Seltzer, P. et Alii, Le Climat de l'Algérie, Algiers.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—BIZERTA. LAT. 37° 16' N., LONG. 9° 48' E. Height above Mean Sea Level, 12 feet.
Climatic Table compiled from 5 to 28 Years' Observations, 1887 to 1936.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE Mean of			SKY No. of days	RAIN No. of days with Average fall 0.04 in. or more	WIND DIRECTION																		Mean wind speed	No. of days with wind of force 8 or more	No. of days with visibility less than half a sea mile †			
		Daily max.	Daily min.	Mean of each month			Percentage of observations from						Percentage of observations from																	
							0800						1400						Percentage of observations from											
							N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm						
January . . .	1018	58	46	66	40	74	5	6	6	6	6	19	15	34	9	3	3	5	6	6	14	19	18	8	12	0.6	2	0.6		
February . . .	1017	59	47	69	42	72	7	7	7	7	7	11	15	36	7	5	6	6	6	6	17	23	13	12	9	14	0.4	2	0.4	
March . . .	1015	63	50	76	46	70	9	5	5	5	5	12	11	43	7	7	9	11	4	8	20	22	8	8	15	1	0.6	0.2	0.2	
April . . .	1014	67	53	79	51	68	12	3	3	3	3	9	20	17	25	13	10	6	3	4	5	25	31	4	2	8	0.4	0	0.2	
May . . .	1015	73	59	84	59	65	14	3	3	3	3	6	21	20	35	17	26	6	1	0	17	34	3	3	7	15	0.4	0	0.2	
June . . .	1016	79	65	92	59	64	12	3	3	3	3	4	19	14	40	19	25	4	0	0	15	26	3	1	6	14	0.4	0	0.2	
July . . .	1016	85	71	99	64	66	22	0.3	0.3	0.3	0.3	7	17	44	19	28	6	3	1	0	15	26	3	1	6	13	0	0	0.2	
August . . .	1016	85	72	99	67	63	21	0.9	0.9	0.9	0.9	10	14	41	18	20	7	12	4	3	7	27	23	10	6	13	0	0	0.2	
September . . .	1017	83	69	95	61	67	14	4	4	4	4	7	10	16	41	8	10	6	7	4	7	18	12	22	6	10	0.4	0	0.4	
October . . .	1016	77	63	90	55	70	10	4	4	4	4	13	17	5	42	6	3	3	8	7	16	24	12	24	7	11	0.6	0	0.4	
November . . .	1017	68	55	78	47	73	5	7	7	7	7	20	10	35	3	3	3	3	3	3	14	24	12	24	7	11	0.6	0	0.4	
December . . .	1017	61	49	67	42	75	5	7	7	7	7	20	10	35	3	3	3	3	3	3	14	24	12	24	7	11	0.6	0	0.4	
Means . . .	1016	71	58	101*	38**	70	—	—	—	—	—	19	14	38	10	13	6	6	4	4	7	22	22	10	7	13	—	—	—	—
Totals . . .	—	—	—	—	—	—	135	48	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	—	—	—	110†	32††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	28	28	28	28	10	28	10	28	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

† At 0700 only.

* Mean of highest each year. ** Mean of lowest each year.

Standard of time = 15° E. meridian.

† Highest recorded temperature.

†† Lowest recorded temperature.

Authorities:—Tunis, Serv. Mété. Bull. Quot. de l'Afrique du Nord.
Tunis, Service Météorologique.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—TUNIS. LAT. 36° 48' N., LONG. 10° 10' E. Height above Mean Sea Level, 108 feet.
Climatic Table compiled from 4 to 39 Years' Observations, 1887 to 1938.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			Relative humidity	SKY No. of days	RAIN No. of days with fall	WIND DIRECTION																Mean wind speed	No. of days with wind of force 8 or more	No. of days with visibility less than half a sea mile †	
		Daily max.	Daily min.	Highest in each month				Lowest in each month	Percentage of observations from								Percentage of observations from										
									N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.		Calm
January	mb. 1019	58	43	67	36	8	11	9	2	3	2	6	24	44	10	4	15	5	6	3	4	11	25	18	8	0	
February	1017	60	44	71	39	6	13	7	4	5	4	6	22	40	12	4	17	6	7	5	5	9	31	19	2	0	
March	1015	65	47	78	42	8	10	5	5	6	5	6	20	39	12	7	21	10	13	7	6	8	24	16	1	0	
April	1014	70	50	85	47	10	10	8	6	6	6	6	19	33	12	9	16	12	8	7	6	6	13	16	1	0	
May	1015	76	56	91	51	18	8	8	6	6	6	6	10	27	16	14	16	16	41	6	1	1	4	10	0	0	
June	1016	85	63	101	54	25	0	10	6	6	6	6	8	23	14	16	19	16	39	7	2	2	6	12	0	0	
July	1016	91	68	106	60	25	0	11	4	6	6	6	8	22	15	18	17	21	39	7	3	1	4	8	0	0	
August	1017	86	65	100	56	12	0	4	4	6	6	6	8	22	11	10	15	11	23	8	10	6	7	11	0	0	
September	1016	78	58	91	49	7	4	5	2	2	3	4	4	22	8	4	11	13	31	7	8	12	16	1	0	0	
October	1016	69	51	80	42	7	6	3	1	2	4	6	25	47	8	4	11	6	11	7	6	6	28	17	5	0	
November	1016	69	51	80	42	7	6	3	1	2	4	6	25	47	8	4	11	6	11	7	6	6	28	17	5	0	
December	1017	61	45	70	37	8	3	6	0	2	3	6	26	44	12	1	13	2	5	4	6	6	35	21	6	0	
Means	1016	74	55	108*	35**	—	—	7	3	4	4	5	20	36	12	9	16	10	22	6	6	6	16	15	1	—	
Totals	—	—	—	—	—	151	57	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Extreme values	—	—	—	118†	30†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. of years' observations	30	35-39	35-39	35-39	35-39	10	36	12	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	4	

* At 0700 only.

† Mean of highest each year.

** Mean of lowest each year.

Standard of time = 15° E. meridian.

† Highest recorded temperature.

†† Lowest recorded temperature.

Authorities:—Tunis, Serv. Météor. Relevé des Obs. and Resumé Climatologique.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—MALTA (VALLETTA). LAT. 35° 54' N., LONG. 14° 31' E. Height above Mean Sea Level, 233 feet.
Climatic Table compiled from 9 to 90 Years' Observations, 1853 to 1947.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE			Relative humidity	SKY No. of days	RAIN No. of days with 0-04 in. or more	WIND DIRECTION																		Mean wind force or speed	No. of days with wind of force 8 or more	No. of days with visibility less than half a sea mile
		Daily max.	Daily min.	Highest in each month				0800						1400														
								Percentage of observations from						Percentage of observations from														
								N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
								Percentage of observations from						Percentage of observations from														
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Standard of time = 15° E. meridian.

* Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

* Mean of highest each year.

Authorities:—MS. data at M.O.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—PALERMO. LAT. 38° 06' N., LONG. 13° 19' E. Height above Mean Sea Level, 233 feet.
Climatic Table compiled from 2 to 50 Years' Observations, 1879 to 1940.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity	SKY No. of days	RAIN No. of days with Average fall 0.04 in. or more	WIND DIRECTION												Mean wind speed	No. of days with force 8 or more	No. of days with visibility less than half a sea mile										
		Daily		Mean of					0800						1900																		
		max.	min.	Highest in each month	Lowest in each month				Percentage of observations from						Percentage of observations from																		
		Percentage of observations from												Percentage of observations from																			
		N.	NE.	E.	SE.				S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.				NW.	Calm								
mb.	° F.	° F.	° F.	° F.	%	%	in.		7	7	3	4	3	3	25	24	15	16	7	7	5	6	5	3	21	14	19	20	7	7	2	3	0
1017	58	47	72	35	68	68	4.4	12	7	7	3	4	4	4	7	26	23	10	15	8	9	12	7	7	13	21	17	11	7	8	3	4	0
1016	56	47	79	37	67	61	2.6	8	6	6	4	5	6	6	31	20	10	20	15	12	4	4	4	4	10	9	16	19	6	7	4	0	
1015	60	49	83	41	66	61	1.4	6	5	4	3	5	5	5	15	18	14	27	10	19	17	5	5	5	10	17	15	5	6	6	2	0	
1013	63	61	88	45	62	57	0	4	8	10	4	3	4	4	4	12	15	36	7	26	17	6	6	4	5	11	17	15	4	6	2	0	
1015	69	61	91	53	59	58	2	2	15	10	4	3	5	3	6	11	39	6	31	23	7	5	4	0	1	6	15	11	4	6	0	0	
1016	75	67	91	53	59	58	0.6	0	13	15	6	3	5	4	6	12	43	9	34	26	7	31	23	2	1	3	15	11	4	6	0	0	
1016	79	72	100	59	64	63	2	0	3	17	8	4	5	5	6	11	7	50	9	31	26	3	3	1	0	6	10	15	3	6	0	0	
1016	82	74	99	61	67	67	1	4	2	3	4	5	2	2	16	11	8	48	4	31	26	3	3	2	1	6	10	16	3	5	0	0	
1017	77	68	96	56	73	72	0.8	1	3	4	2	2	5	5	20	15	8	38	4	9	13	3	9	6	10	16	33	5	5	1	0	0	
1016	71	63	90	48	72	73	4	7	3	3	2	2	6	3	17	16	9	46	4	4	6	3	9	6	11	9	10	42	4	5	0	0	
1017	63	55	80	49	75	77	5.2	13	4	3	1	1	2	3	22	29	7	26	7	7	4	4	4	4	15	13	11	34	6	6	2	0	
1016	58	49	73	37	72	71	15	4	3	3	1	2	2	3	22	29	7	26	7	7	4	4	4	4	15	13	11	34	6	6	2	0	
Means	67	59	104*	34**	67	66	—	—	4	5	5	4	4	4	17	16	10	35	7	17	15	5	2	8	10	15	21	5	6	19	—	0.4	
Totals	—	—	—	—	—	124	94	30†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. of years' observations	41	41	24	24	2	2	4	5-6	50	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	

† At 0700 only.

* Mean of highest each year.

** Mean of lowest each year.

Standard of time = 15° E. meridian.

† Highest recorded temperature.

†† Lowest recorded temperature.

Authorities.:—MS. data supplied by R. Ufficio Centrale di Meteorologia e Geodinamica, Rome.
Rome, R. Uff. Cent. Met. e Geofis. Annali.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—MESSINA. LAT. 38° 12' N., LONG. 15° 33' E. Height above Mean Sea Level, 177 feet.
Climatic Table compiled from 1 to 41 Years' Observations, 1880 to 1938.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			Relative humidity	SKY: No. of days	RAIN No. of days with Average fall	WIND DIRECTION																		Mean wind speed 0800 1900	No. of days with wind of force 8 or more	No. of days with visibility less than half a sea mile †			
		Daily max.	Daily min.	Highest in each month				Lowest in each month	Percentage of observations from						Percentage of observations from																
									0800						1900																
									N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.				Calm		
January	mb.	56	47	64	40	69	61	17	3	0	0	1	4	15	13	20	27	21	4	0	0	1	6	16	7	15	31	6	7	0.2	0
February	1018	56	49	66	41	68	57	14	3	0	0	0	7	14	11	30	21	24	5	0	1	1	8	15	9	23	21	8	9	0.2	0.1
March	1016	59	50	69	44	68	57	15	3	0	0	0	15	15	7	18	37	14	4	1	1	1	16	15	8	15	26	8	10	0.1	0.1
April	1015	63	55	73	48	66	57	7	12	0	3	1	15	5	5	17	12	22	12	1	1	1	13	13	9	19	14	9	9	0.1	0.1
May	1016	68	62	82	54	61	57	22	11	1	2	2	16	4	3	16	11	33	19	0	0	0	15	15	9	12	16	9	9	0.3	0.3
June	1017	76	70	88	61	62	53	22	11	1	2	2	10	2	2	16	12	35	31	2	0	0	12	9	7	13	13	7	7	0	0
July	1018	82	76	93	63	59	53	14	3	0	1	7	5	3	18	12	25	23	14	0	1	1	13	6	6	14	14	6	6	0	0
August	1017	83	76	93	69	61	51	19	2	0	1	10	4	4	18	23	22	14	4	1	1	18	11	4	13	15	23	7	7	0.2	0.1
September	1018	78	70	88	63	65	61	12	4	0	1	14	7	5	18	25	22	14	4	1	1	16	16	3	15	23	7	7	0	0.1	
October	1018	75	66	83	55	69	61	7	9	0	0	12	14	6	11	46	14	3	0	1	1	15	19	5	13	31	5	6	8	0.8	0.1
November	1019	65	57	73	49	71	63	10	1	0	0	1	12	18	10	16	26	14	2	0	1	15	10	8	20	30	3	8	1	0.5	0.5
December	1018	59	53	66	43	67	63	12	4	3	1	12	18	10	16	26	14	2	0	1	15	10	8	20	30	3	8	1	0.5	0.5	
Means	1017	68	61	95*	38**	65	58	21	10	0	1	10	12	6	18	23	23	11	0	1	13	13	5	15	20	7	8	7	8	1	1
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	41	41	41	22	22	2	2	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	10

* Mean of highest each year. † At 0700 only. ‡ Standard of time = 15° E. meridian. †† Lowest recorded temperature.

§ Estimated. ** Mean of lowest each year. † Highest recorded temperature.

Authorities :—Messina, Istituto Geofisico e Geodetico Annuario Meteorologico.

MS. data supplied by R. Ufficio Centrale di Meteorologia e Geodinamica, Rome.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—CATANIA. LAT. 37° 28' N., LONG. 15° 04' E. Height above Mean Sea Level, 20 feet.
Climatic Table compiled from 2 to 57 Years' Observations, 1866 to 1946.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE			Relative humidity	SKY No. of days	RAIN		WIND DIRECTION												Mean wind speed	No. of days with wind of force 8 or more	No. of days with visibility less than half a sea mile																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		Daily max.	Daily min.	Mean of each month			Lowest in each month	Average fall	No. of days with 0-04 in. or more	Percentage of observations from						Percentage of observations from																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Standard of time—15° E. meridian.

* Mean of highest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

Authorities:—Catania, R. Osservatorio. Oss. Meteor.
Roma, Ministero dei Lavori Pubblici. Distribuzione della temperatura dell'aria in Italia nel decennis. 1926-35.
Eredia, F.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

CHAPTER II

THE SOUTHERN COAST OF SPAIN—GIBRALTAR TO CABO SAN ANTONIO

Chart 144.

GIBRALTAR.—General remarks.—A fuller description of Gibraltar, with directions for approaching from westward or eastward, is given in the West Coasts of Spain and Portugal Pilot.

5 Gibraltar, a remarkable mountainous promontory, known generally by British seamen as The Rock, is the Calpe of the Phœnicians and Romans, the Jebel Tarik of the Arabs and the Monte de Gibraltar of the Spaniards. It rises abruptly on the southern side of the Neutral ground, attaining an elevation of 1,396 feet (425^m5). Southward it
10 falls in short terraces and terminates in Europa point. See views facing page 64.

Europa point terminates north-westward and south-eastward, respectively, in Little Europa point and Great Europa point (*Lat.* 36° 06' N., *Long.* 5° 21' W.), situated about 3 cables apart; it is
15 fringed by a shoal bank extending from one half to one cable offshore.

The eastern side of The Rock is steep and inaccessible; Passage point and The Monkeys Alameda are on this side about 2 cables and one mile, respectively, northward of Great Europa point. The village of Catalan is situated on the shores of Catalan bay about three-quarters
20 of a mile northward of the Monkeys Alameda, and between them is Salto Garrobo; above this last is a large rain-water catchment.

Submarine cables, see page 19, are laid off Salto Garrobo in an area the limits of which are indicated by pecked lines on the chart.

The northern side of The Rock rises abruptly like a wall to an
25 elevation of 1,356 feet (413^m3).

The Isthmus of Gibraltar is a sandy plain, from 2 to 6 feet (0^m6 to 1^m8) high and mostly barren, that extends northward from The Rock to the foot of Sierra Carbonera. The southern portion, between The Rock and the British lines, is occupied by some temporary buildings,
30 gardens, a cemetery, and a racecourse. Between the British and Spanish lines is the Neutral ground and immediately within Spanish territory is the town of La Linea.

Signal stations.—The signal station is situated on a rocky ridge, 1,295 feet (394^m7) high, about 1½ miles northward of Europa point.

35 The Admiralty signal station is situated on the northern end of Windmill Hill flats, about half a mile northward of Europa point. Reports through Lloyds are received and transmitted by this station.

Light.—Fog signal.—A light is exhibited, at an elevation of 156 feet (47^m5), from Victoria tower, grey, cylindrical and 61 feet (18^m6)

Charts 1448, 142, 3578, 773, 92, 2717, 2158a.

Chart 144.

in height, situated on Great Europa point. A fog signal is sounded from the lighthouse (*Lat. 36° 06' N., Long. 5° 21' W.*).

Life-saving.—A lifeboat is stationed at Gibraltar, and life-saving appliances are maintained at Great and Little Europa point. *See* 5 page 15.

Aircraft runway.—**Light-buoy.**—An aircraft runway is established across the isthmus, southward of the British lines, and projects westward into Gibraltar bay. A conical light-buoy, painted black and exhibiting a *white fixed* light, for the assistance of aircraft approaching 10 this runway from eastward, is moored off the eastern side of the isthmus, approximately on the alignment of the runway and about 5 cables offshore.

Anchorage.—In 1935, H.M.A.S. *Sydney* anchored several times, in a depth of 11 fathoms (20^m), about 5½ cables eastward of a prominent chimney situated one cable south-south-eastward of the Devil's tower, which tower stands at the north-eastern end of The Rock. The holding ground was found to be good, and on one occasion the vessel rode out a full gale without dragging. The works to which the chimney belongs are usually brilliantly illuminated all night. 20

Prohibited anchorage.—Anchorage is prohibited in areas, the limits of which are indicated by pecked lines on the chart, one westward and north-westward of Europa point and the other off Salto Garrobo.

Tidal streams.—Off the eastern side of Gibraltar, the tidal stream usually runs southward for about 8½ hours from about 4 hours after 25 high water at Gibraltar to about the time of the following high water there. The north-going tidal stream, which is often no more than a stand, runs from about half an hour after to about 3½ hours after high water at Gibraltar.

Chart 3578.

Submarine Exercise Areas.—Two areas, within which submarines exercising may be met, are indicated on the charts by pecked lines, with their centres about 11½ and 19½ miles, respectively, north-eastward of Europa point. 30

Target.—**Buoys.**—A target is moored about 6½ cables south-eastward of the Devil's tower, and three white buoys are moored about half a mile north-eastward, eastward and south-eastward, respectively, of the target. 35

Tunny fishery.—Tunny nets may be found off the eastern coast of Gibraltar, northward of Catalan bay, between May and October. 40 *See* page 27.

Climatic table.—*See* page 49.

Chart 2158a.

SOUTHERN COAST OF SPAIN.—**General remarks.**—The southern coast of Spain, from the Isthmus of Gibraltar, trends about 45 155 miles eastward to Cabo de Gata and thence about 170 miles north-eastward to Cabo de San Antonio. It presents a series of fertile areas, arid plains, gently sloping beaches, rugged coasts, salient headlands and bays. In most parts it can be approached to a short distance and there are few off-lying dangers. The coastal hills are of moderate elevation, but are backed by high mountains. No large rivers debouch on this coast. The only islands are small and lie close inshore, with the exceptions of Las Hormigas, *see* page 100, Isla 50

Charts 1448, 142, 773, 92, 2717, 2158a.

Chart 2158a.

Grosa, *see* page 101, Isle de Tabarca, *see* page 104, and Islote de Benidorme, *see* page 108. Cartagena, *see* page 96, is the only natural harbour, but several artificial ones have been constructed.

5 *Chart 1448.*

Coast.—From the ruins of Fuerte de Santa Barbara, at the eastern end of the Spanish lines, the coast trends about $12\frac{1}{2}$ miles north-north-eastward to Sabinilla, *see* chart 3578.

Sierra Carbonera, a southerly extension of Serrania de Ronda, rises
10 to an elevation of 1,025 feet (312^m4) about $3\frac{1}{2}$ miles northward of the northern side of The Rock. Nearly half a mile southward of its highest point, and on the same ridge, is Torre Carbonera or Queen of Spain's chair, an ancient watch-tower standing at an elevation of 935 feet (285^m0). From eastward, in poor visibility, the dip between
15 the mountains and The Rock might be mistaken for the approach to the Strait of Gibraltar.

Mala bahia or Blackstrap bay extends from the Devil's tower to Torre Nueva, about $3\frac{1}{2}$ miles northward. It has a sandy beach with no dangers beyond 3 cables offshore.

20 La Tunara is a village near the coast north-eastward of La Linea. Torre Nueva, near which is a coastguard hut, stands on a low rocky point.

Torre Carbonera stands on a slightly higher point of reddish rock about $2\frac{1}{2}$ miles north-north-eastward of Torre Nueva; the sandy
25 beach between these points is fringed with rocks extending a short distance offshore. Close to Torre Carbonera is a coastguard station.

Rio Guadiaro, which flows into the sea about $2\frac{1}{2}$ miles north-north-eastward of Torre Carbonera, rises in Serrania de Ronda. Though swollen in winter, in summer only small craft can enter at high water
30 on account of a bar. There is excellent shelter for boats from all winds inside.

Cala Sardina is an open bight, with a sandy beach, between the mouth of Rio Guadiaro and Punta de la Chullera, about $2\frac{1}{2}$ miles north-eastward. Torre Guadiaro is situated about 6 cables northward of
35 the mouth of Rio Guadiaro, and about three-quarters of a mile west-south-westward of Punta de la Chullera stands a prominent coastguard station (*Lat.* $36^{\circ} 18' N.$, *Long.* $5^{\circ} 16' W.$).

Punta de la Chullera is also known as Punta de la Cala Sardina, and on a hill above it stands Torre de la Chullera, near which is a coast-
40 guard hut.

Piedra Heroe, with a depth of 10 feet (3^m0), lies about 2 cables south-south-eastward of Punta de la Chullera.

Anchorage.—Cala Sardina affords anchorage to small vessels, close inshore within some stony patches.

45 *Chart 3578.*

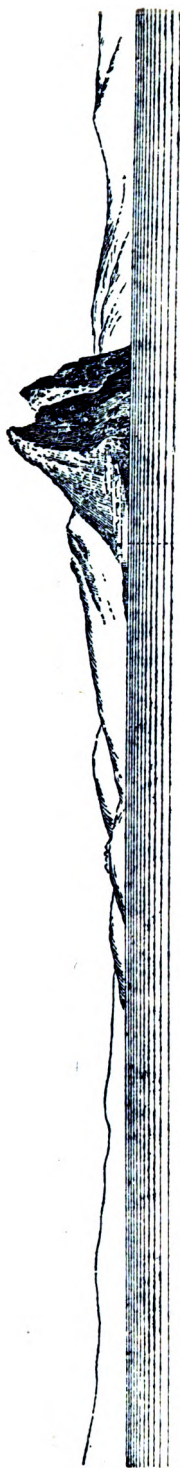
Coast.—From Punta de la Chullera the coast trends about $1\frac{1}{2}$ miles northward to abreast Piedra Alcorrin, and through it Arroyo Negro and Arroyo Martugina flow into the sea.

Chart 1588, plan of Sabinilla anchorage.

50 **Fondeadero de la Sabinilla.**—**Caution.**—From abreast Piedra Alcorrin, the sandy shore of Fondeadero de la Sabinilla trends about $2\frac{1}{2}$ miles north-north-eastward to a rocky point on which stands Torre del Salto de la Mora or de la Sal, and behind it the land rises gradually. *See* view facing page 64.

Charts 142, 3578, 773, 92, 2717, 2158a.

Rock of Gibraltar.



San Roque.

Europa point,
bearing 000° , 9 miles.

Gibraltar from southward.

(Original dated 1893.)



Sierra Bullones.

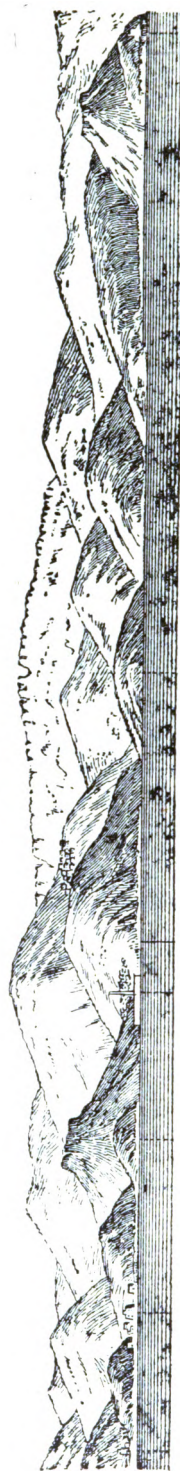
Europa
point,

bearing 243° , 11 miles.

Strait of Gibraltar from eastward.

(Original dated 1893.)

Gibraltar.



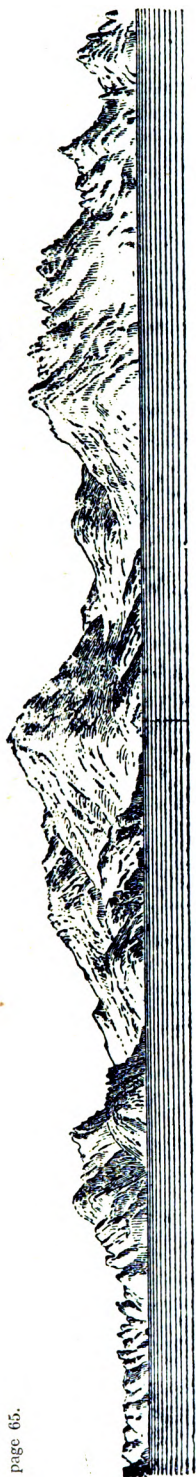
Castillo de
la Sabinilla,
bearing 274° ,
 $2\frac{1}{2}$ miles.

Torre de
la Duquesa.

Cerro
del Salta
de la Nôra.

Fondeadero de la Sabinilla from eastward.

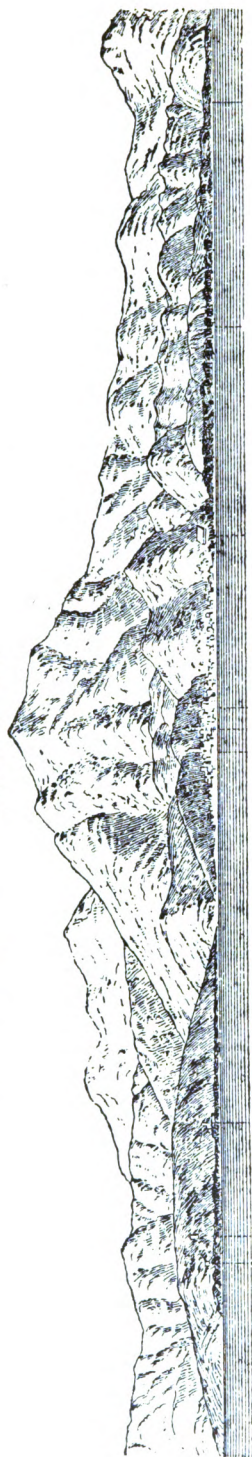
(Original dated 1888.)



Sierra de Marbella.

Estepona,
bearing 336° , 12 miles.

Approach to Estepona from south-south-eastward.
(Original dated 1925.)



*Punta de
la Doncella
lighthouse.*

Estepona,
bearing 318° , 3 miles.

Fondeadero de Estepona from south-eastward.

*Punta
de la Plata.*



La Concha. Pico du Joana. Calvary church,

bearing 351° ,
1½ miles.

Cemetery.

Marbella from south-south-eastward.
(Originals dated 1888.)

Chart 1588, plan of Sabinilla anchorage.

Piedra Alcorrin lies about one cable offshore and northward of it lie several rocky heads, some of which dry. These dangers will be avoided by keeping at least $2\frac{1}{2}$ cables offshore.

Castillo de la Sabinilla is a ruined, red tower standing close to the shore about 2 miles south-south-westward of Torre del Salto de la Mora. A coastguard station stands close northward of the castle, and from abreast it a rocky shelf extends a short distance offshore.

Torre de la Duquesa stands about 3 cables south-south-westward of Castillo de la Sabinilla, and Arroyo del Estanquino flows into the sea between them.

Sabinilla is a fishing village situated close southward and westward of Castillo de la Sabinilla. A disused factory, with a chimney about 125 feet (38^m1) high, is situated about $6\frac{1}{2}$ cables north-north-eastward of the castle.

Manilva, *see* chart 3578, is a town situated on moderately high ground, about $1\frac{1}{2}$ miles north-westward of Sabinilla.

Laja de la Torre del Salto de la Mora dries, and is the outermost of a group of islets and rocks lying within 2 cables eastward of Torre del Salto de la Mora. This shoal is usually marked by breakers and should be given a wide berth.

Anchorage.—During offshore winds, anchorage can be obtained anywhere off the coast as far southward as Mala bahia.

In Fondeadero de la Sabinilla, small vessels can anchor, south-eastward of Torre de la Duquesa, near Piedra Alcorrin. Larger vessels can anchor, in depths of not less than 5 fathoms (9^m1).

Chart 3578.

Coast.—From the point on which stands Torre del Salto de la Mora, the coast trends about $3\frac{1}{2}$ miles north-eastward to Punta de Alfaro or de la Sal Vieja.

Islote Palomas lies close inshore about 6 cables north-eastward of Torre del Salto de la Mora, and is small and low.

Torre de Arroyo Vaquero stands on a hillock, dominating a rocky point, about $1\frac{1}{2}$ miles north-eastward of Torre del Salto de la Mora.

Sierra Bermeja, one of the most prominent objects along this stretch of coast, rises to a rocky peak, 4,728 feet (1,441^m0) high, about 5 miles northward of Torre de Arroyo Vaquero, and on it there are some remains of Moorish fortifications. This peak is easily identified from a great distance, especially from southward, because it is the highest mountain in this vicinity. *See* views facing pages 64 and 65.

Chart 1588, plan of Estepona anchorage.

Las Mesas rise to an elevation of 315 feet (96^m0) about 6 cables north-north-westward of Punta de Alfaro, and near the point, at an elevation of 138 feet (42^m1), stands Torre de las Saladas or de la Sal Vieja. A coastguard hut stands on Punta de Alfaro (*Lat.* 36° 25' N., *Long.* 5° 10' W.), and from the point sunken rocks extend about 2 cables southward.

Roquero de Alfaro, a detached rocky patch, with depths of from 5 to 7 fathoms (9^m1 to 12^m8), lies about 4 cables southward of Punta de Alfaro.

Submarine cable.—A submarine cable is landed close westward of Punta de Alfaro. *See* page 19.

Fondeadero de Estepona.—This open roadstead, which is free from off-lying dangers, is entered between Punta de la Doncella, about

Charts 142, 773, 92, 2717, 2158a.

Chart 1588, plan of Estepona anchorage.

3½ cables north-eastward of Punta de Alfaro, and Punta de los Mármoles, about 1½ miles farther north-eastward. See views facing page 65.

5 A light is exhibited, at an elevation of 102 feet (31^m1), from a black, octagonal, pyramidal tower with a grey lantern and a white dwelling attached, 69 feet (21^m0) in height, situated on Punta de la Doncella.

A mole extends about 2 cables south-westward from Punta de la Doncella. In 1949, there were depths of from 6 to 13 feet (1^m8 to 10 4^m0) within it.

A light is exhibited, at an elevation of 30 feet (9^m1), from a metal framework structure, 17 feet (5^m3) in height, situated on the head of the mole.

The town of Estepona stands about half a mile north-eastward of 15 Punta de la Doncella. It is divided into two parts by Torrente de Calancha, and on either side of it flow Rio Monterroso and Rio Cala Pacheco.

Pilots are available, but pilotage, see page 20, is not compulsory.

Rio Monterroso or Monterrojo rises in Sierra Bermeja, and its 20 mouth is spanned by a bridge with two arches, close westward of the town.

Punta de los Mármoles or de Pinillos is low and fringed with a beach. Within 4½ cables south-eastward of the point there are several rocky heads, with depths of from 2½ to 4½ fathoms (5^m0 to 8^m7), 25 which are locally known as Los Balcones.

Punta de la Plata, about 3½ cables east-north-eastward of Punta de los Mármoles, is another low point fringed with a beach, and about midway between them a small stream flows into the sea. Cabezo del Lance de los Moros, with a depth of 8 feet (2^m4), lies about one cable 30 south-eastward of Punta de la Plata.

Anchorage.—The best berth off Estepona, avoiding the stony patches known as Los Cipreses, is, in a depth of about 6½ fathoms (11^m9), sand, with the hermitage of El Calvario, situated on a hill behind the town, bearing about 321°, and the lighthouse on Punta de 35 la Doncella bearing about 258°.

Anchorage can also be obtained closer inshore, in a depth of about 5 fathoms (9^m1).

Chart 3578.

Coast.—From Punta de la Plata the coast trends about 5½ miles 40 east-north-eastward to Punta de Baños.

Torre del Padrón stands close to the coast, on a hill of moderate elevation, about one mile east-north-eastward of Punta de la Plata. Close eastward of this tower is the mouth of Rio del Padrón, which is spanned by a steel bridge.

45 Punta del Castor, about one mile north-eastward of Torre del Padrón, is low and projects little from the line of the coast. Close westward of it is the mouth of Rio Castor, and close off the point are several rocks.

Torre de Albelerin (*Lat. 36° 27' N., Long. 5° 05' W.*) stands on a 50 sandhill close to the coast about one-quarter of a mile north-eastward of Punta del Castor.

Torre de Guadalmazza, on the sandy Punta de Guadalmazza, is a square tower situated about 1½ miles eastward of Torre de Albelerin. Close to it is a coastguard station, and close eastward of it Rio Guadal-

Charts 773, 2717, 2158a.

Chart 3578.

maza or Guadalmansa, which rises in Sierra Bermeja, flows into the sea. On the shores of the bay between Punta del Castor and Punta del Guadalmazza stands a factory painted red and with a red brick chimney. 5

Torre del Saladillo stands, on a sandy hillock close to the coast, about $1\frac{1}{2}$ miles north-eastward of Torre de Guadalmazza; from abreast it a sandy beach, on which are some fishermen's huts, extends eastward.

Torre de Baños is round and stands, on the low rocky Punta de Baños, about one mile eastward of Torre del Saladillo. 10

Monte Mayor rises to an elevation of 1,870 feet (570^m0), about 4 miles north-north-westward of Punta de Baños. It is a well-defined conical summit crowned by the ruins of a castle, by which it may be identified.

Off-lying bank.—Banco del Calminillo or Placer de las Bóvedas 15 has a least charted depth of 11 fathoms (20^m1), sand and rock; it lies about 3 miles south-south-eastward of Torre de Baños. In the opinion of local mariners and fishermen, a very steep-to patch exists on this bank, with a depth of only 8 fathoms (14^m6). Vessels should avoid passing over this bank, as rocky heads with less depths than those 20 charted may exist.

Anchorage.—There is anchorage eastward of the mouth of Rio del Padrón, in depths of about $7\frac{1}{2}$ fathoms (13^m7), care being taken to avoid rocky patches.

There is anchorage, for vessels with local knowledge, off the factory 25 between Torre de Albelerin and Torre del Guadalmazza.

Coast.—From Punta de Baños, the coast trends about 7 miles north-eastward to Marbella.

Torre de las Bóvedas stands on the coast about $1\frac{1}{2}$ miles east-north-eastward of Torre de Baños. It is a massive round tower and stands 30 close north-eastward of the mouth of Arroyo de Baños and about half a cable westward of a two-storied coastguard station.

San Pedro de Alcántara is situated on rising ground about $1\frac{1}{2}$ miles north-north-eastward of Torre de las Bóvedas. It consists of a prominent group of houses with a sugar factory. 35

Torre del Duque stands on the coast about 2 miles north-eastward of Torre de las Bóvedas. Laja del Duque is a reef lying about one-quarter of a cable offshore, half a mile south-westward of Torre del Duque (*Lat.* 36° 29' N., *Long.* 4° 58' W.).

Torre de Alarcón is situated about $1\frac{1}{2}$ miles north-eastward of Torre 40 del Duque, and about midway between is the mouth of Rio Verde. A rocky projection, close to which is a small settlement, lies close eastward of Torre de Alarcón.

Sierra de Marbella is not so high as Sierra Bermeja, and may be identified by being more extended eastward and westward than the 45 latter, and by its crest being more irregular. It slopes down to the coast and forms a good landmark. La Concha, the summit, attains an elevation of 4,039 feet (1,231^m1) about 3 miles northward of Torre de Alarcón.

Pico de Juanita is 3,884 feet (1,138^m8) high and is situated $1\frac{1}{2}$ miles 50 north-eastward of La Concha. See view facing page 65.

Chart 1588, plan of Marbella anchorage.

Marbella.—**Light.**—The town of Marbella, see view facing page 65, stands on both banks close to the mouth of Rio de la Tenería. The

Chart 1588, plan of Marbella anchorage.

church, which is prominent, stands about 3 cables east-north-eastward of the lighthouse.

A light is exhibited, at an elevation of 52 feet (15^m8), from a grey lantern on a yellow house with a red roof, 36 feet (11^m0) in height, situated about one cable westward of the town. In 1950, it was reported that this lighthouse was difficult to distinguish.

Casa del Fuerte is a white three-storied building situated near the shore about 2½ cables eastward of the lighthouse; for about 4 cables south-eastward of it the bottom is rocky, and about 1½ cables westward of it are the foundations of a small stone jetty.

Pilotage, *see* page 20, is compulsory.

Anchorage.—There is anchorage, with offshore winds in depths of 8 or 9 fathoms (14^m6 or 16^m5), with Marbella lighthouse bearing 009°, distant about 4½ cables. No vessel, other than small craft, should venture closer inshore, especially in winter.

Chart 773.

Coast.—Light.—Buoy.—From Marbella the coast trends about 12½ miles eastward to Punta de Calaburras, and thence about 2 miles north-north-eastward to Fuengirola.

Torre Real and Torre Real de Zaragoza stand, respectively, about 2 and 5 miles east-south-eastward of Marbella; near each of these towers is a coastguard hut.

Punta Lance de la Cañas, which is fringed with rocks, is situated about 1½ miles east-south-eastward of Torre Real de Zaragoza; on the eastern side of this point is a round tower (*Lat.* 36° 29' N., *Long.* 4° 46' W.).

Torre Ladrones is a square tower situated on the rocky Punta Ladrones about three-quarters of a mile eastward of Punta Lance de la Cañas; near it is a coastguard hut.

Torre Cala-honda stands on high ground near a flat point about 1½ miles eastward of Torre Ladrones, and between them is a small bay in which are three small rocky points.

Torre Pesetas or Nueva, close to which is a coastguard hut, stands above a high point about one mile east-north-eastward of Torre Cala-honda. The high point slopes down evenly to a reef, which dries and extends about 3½ cables south-south-eastward from it.

Torreon de Cala Moral is an old martello tower about one mile north-eastward of Torre Pesetas; close to it is a coastguard hut, and close eastward of it are some fishermen's dwellings. The bay, on the shores of which it is situated, is foul.

Punta de Calaburras is situated about 2 miles eastward of Torreon de Cala Moral, and is easily identified by an ancient tower, a disused lighthouse, a coastguard hut and the modern lighthouse which are situated on it. This point is fringed with rocks extending about half a cable south-eastward from it. *See* view facing this page. Cabezo El Fraile is about 3 feet (0^m9) high, and lies 3½ cables offshore about one mile westward of the point.

A light is exhibited, at an elevation of 151 feet (46^m0), from a white circular tower, 83 feet (25^m3) in height, situated on Punta de Calaburras.

Punta de la Peñuela or de Fuengirola is situated about one mile north-north-eastward of Punta de Calaburras, and is fringed with rocks. Between these two points are three rocks lying within one

Charts 2717, 2168a.



Punta de Calaburras lighthouse, bearing about 250°, 7 miles.

Fuengirola.

Castillo de Fuengirola.

Coast southward of Fuengirola from east-north-eastward.



Sierra Mijas.

Punta de Calaburras lighthouse.

Castillo de Fuengirola.

Fuengirola church bearing 339°, 3½ miles.

Fuengirola from south-eastward.

El Boliche.

Benalmadena.



Carriñuela.

Town.

Castillo de Torre Molinos, bearing 305°, 4 miles.

Torremolinos from east-south-eastward.

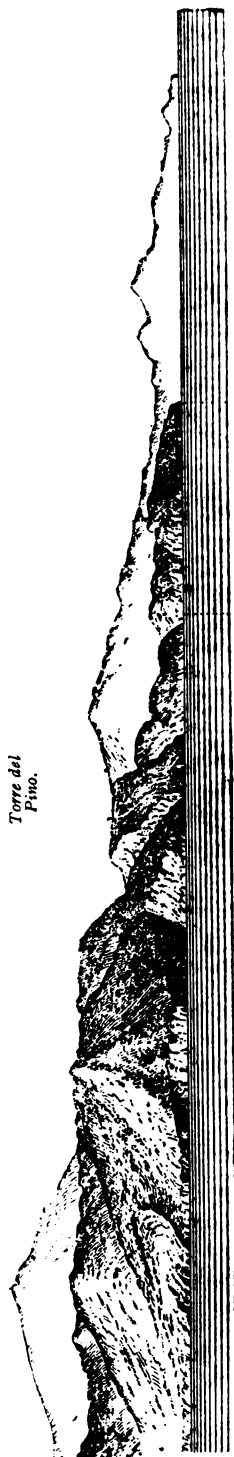
(Originals dated 1898.)



*Punta de Viles-
Malaga, bearing
011°, 9 miles.*

*Pico de
Zafarraya,
bearing 037°.
Pico de Zafarraya from south-westward.*

*Torre del
Pino.*



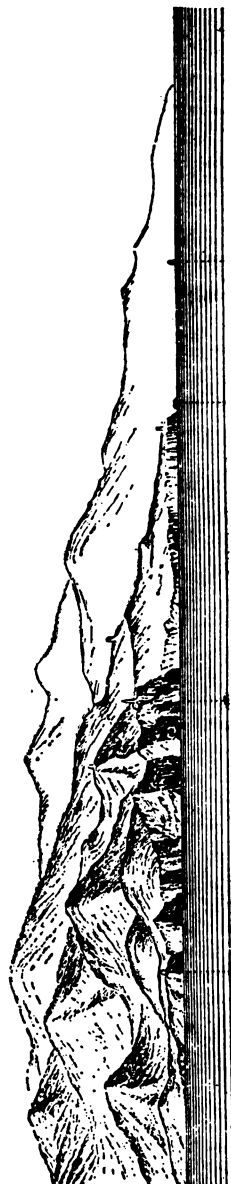
Herradura.

*Punta de la
Concepción.*

Fondeadero de Herradura from westward.

Sierra de Guachos.

Torre Melonar.



*Cabo Sacratif
lighthouse,
bearing 070°, about 5 miles.*

*Castillo
de Carchuna.
disused lighthouse.*

Cabo Sacratif from west-south-westward.

(Originals dated 1898.)

*Cabo
Sacratif,
bearing 090°, 24 miles*

Chart 773.

cable of the coast, and about one cable eastward of Punta de la Peñuela is a shoal, with a depth of about one fathom (1^m8).

Fondeadero de Fuengirola.—**Light.**—This open roadstead, *see* view facing page 68, is off a beach which extends northward from Punta de la Peñuela to Torre Blanca, *see* page below. This anchorage is free from off-lying dangers, except for a reef, with a depth of less than 6 feet (1^m8), which lies about half a cable offshore southward of some lime works.

Castillo de Fuengirola stands on a hillock near the southern end of the beach and is in ruins.

The town of Fuengirola, with its suburb El Boliche close northward of it, stands near the middle of the beach at the foot of Sierra Mijas, *see* below.

A mole is under construction, which, when completed, will extend about one cable south-eastward, thence 2½ cables southward, and thence three-quarters of a cable south-south-westward. In 1949 the first part had been completed and some progress had been made with the second part. The end of the visible part should be given a berth of at least 55 yards (50^m3).

Anchorage.—Fondeadero de Fuengirola affords good shelter during north-westerly winds. The best berth for a large vessel is, in depths of 10 or 12 fathoms (18^m3 or 21^m9), with the castle bearing about 230°. Small vessels can anchor closer inshore in depths of 6 or 7 fathoms (11^m0 or 12^m3).

Coast.—**Dangers.**—Torre Blanca stands on the coast about one mile north-eastward of El Boliche; close northward of it is a prominent white coastguard station (*Lat.* 36° 34' N., *Long.* 4° 35' W.).

Bajo de la Yesera, with a depth of one fathom (1^m8), lies about half a mile south-south-westward of Torre Blanca.

Sierra Mijas attains an elevation of 3,789 feet (1,154^m9) about 4 miles north-westward of Torre Blanca, *see* view facing page 68. From eastward, this range of mountains may be identified from Sierra Bermeja or Sierra de Marbella by the town of Mijas, which appears as a white band about half-way up its southern slopes.

Torre Benalmádena or de Muelle is situated on the coast about 1½ miles north-eastward of Torre Blanca, and on one of the spurs of Sierra Mijas; about one mile northward of it and visible from seaward is the town of Benalmádena.

Torre Quebrada stands on a salient rocky point about 1½ miles north-eastward of Torre Benalmádena. The coast between Torre Blanca and Torre Quebrada is mostly rocky with a few sandy patches.

Punta de Aneal and Punta de Perulejo lie, respectively, about one mile and 1½ miles north-eastward of Torre Quebrada.

Laja de Bermeja, with a depth of 1½ fathoms (2^m7), rock, lies close eastward of Punta de Perulejo and about 3 cables southward of Torre Bermeja, *see* below; the sea nearly always breaks over it. Several vessels have been wrecked on this shoal and there may be lesser depths over their remains.

Chart 1588, plan of Torremolinos anchorage.

Fondeadero de Torremolinos.—This open roadstead, *see* view facing page 68, is off Playa de Torremolinos, which extends north-eastward from Punta del Saltillo to Málaga, *see* page 70.

Punta del Saltillo lies about 2 cables east-north-eastward of Torre

Charts 2717, 2158a.

Chart 1588, plan of Torremolinos anchorage.

Bermeja, close to which tower is a noticeable white coastguard hut. A reef extends about three-quarters of a cable south-eastward from Punta del Saltillo.

- 5 Punta de Torremolinos is a small rocky projection in Playa de Torremolinos, about $1\frac{1}{2}$ miles north-eastward of Punta del Saltillo; on its summit stands Castillo de Torremolinos.

About half a mile northward of Castillo de Torremolinos, on the slopes of Sierra Mijas, is the small town of Torremolinos, which shows
10 up well from eastward.

Anchorage.—Fondeadero de Torremolinos affords anchorage anywhere. A vessel wishing to lie near the town can anchor eastward of it, in depths of from 8 to 11 fathoms (14^m6 to 20^m1). Small vessels can anchor, in depths of from 8 to 10 fathoms (14^m6 to 18^m3) or less; a good
15 berth is off Carihuela, a village on the shore southward of the castle.

Chart 733.

MÁLAGA AND APPROACHES.—Ensenada de Málaga is entered between Punta de Torremolinos and Punta de los Cantales, see page 73, about 11 miles north-eastward; at its head lies Puerto
20 de Málaga. This bay is easily identified from whichever direction it is approached; south-westward is Sierra Mijas, and on its northern side rise Cordillera de Málaga; this latter range extends eastward as far as Tetás de Málaga; two prominent peaks which rise close to Cerro de San Antón, situated about 3 miles north-eastward of Málaga, and
25 from south-eastward are seen over it. See view facing page 68.

Santo Pitar, 3,360 feet ($1,024^m1$) high, about 7 miles north-eastward of Málaga, is a rounded mountain with a small tower on the face of its south-western summit.

A conspicuous chimney stands near the shore about 5 miles north-
30 north-eastward of Torremolinos; and another conspicuous chimney stands near the coast about 2 miles westward of Punta de los Cantales.

Chart 1848.

Prominent objects in Málaga are:—The cathedral with a single spire; Castillo de Gibralfaro, situated, at an elevation of 463 feet
35 (141^m1), on the eastern side of the city; a radio mast, 246 feet (75^m0) in height, situated near the castle, from which, at night, two red lights are exhibited. At night, the flames, from the furnace chimneys of the Heredia ironworks, westward of the mouth of Rio Guadalmedina, are visible from a considerable distance; the tallest chimney is 249 feet
40 (75^m8) high.

Whilst it may be blowing hard from south-westward in the offing, southerly or south-westerly winds seldom blow home in the winter, those from north-north-westward being most common at the head of the bay. The bay is dangerous during strong south-easterly winds.
45 In 1928, H.M.S. *Adventure* reported that with south-easterly winds a heavy swell rolls into the bay and breaks in depths of 5 fathoms (9^m1) south-westward of the harbour.

Between Torremolinos and Málaga the shore is low and flat, rising inland to the foothills of the mountains.

50 Churriana (Lat. $36^{\circ} 40' N.$, Long. $4^{\circ} 30' W.$) is a town situated about $2\frac{1}{2}$ miles northward of Torremolinos and $1\frac{1}{2}$ miles inland; between it and Málaga are several villages and a number of factories and foundries.

Charts 2717, 2158a.

Chart 1848.

Rio Guadalhorce rises in Sierra de Jorge, and flows into the sea about midway between Torremolinos and Málaga. Across the mouth of this river lies a shallow bar and off it a bank, with depths of less than 18 feet (5^m3), extends as much as 3 cables seaward; caution 5 must be exercised when passing the mouth of this river.

Playa de San Andrés is a shelving beach northward of the mouth of Rio Guadalhorce; from the numerous factories near it, it is also known as Playa de las Fabricás.

Eastward of Málaga, the shore is moderately elevated, cliffy and 10 fringed with rocks, in places; in it are several indentations, that on the shores of which the suburb of El Palo stands being about 2½ miles eastward of the town.

Submarine cables.—Buoy.—Submarine cables are landed at a hut on Playa de San Andrés; the area in which they lie is indicated 15 on the chart by pecked lines. *See* page 9.

Two green cable buoys are moored one and 2 miles, respectively, south-south-westward of the entrance to Puerto de Málaga.

Charts 1848 and 773.

Anchorage.—Directions.—A vessel of deep draught should anchor 20 on or eastward of the alignment of San Nicolas lighthouse, *see* page 72, and the cathedral, in depths of from 10 to 15 fathoms (18^m3 to 27^m4).

No vessel should anchor westward of the alignment of the head of the western mole with the lighthouse on account of the submarine 25 cables referred to above.

Vessels are recommended to lie at single anchor.

At night, a vessel approaching from southward should keep San Nicolas light (*Lat.* 36° 43' N., *Long.* 4° 25' W.) bearing less than 020° to clear the shoal bank off the mouth of Rio Guadalhorce, and in thick 30 weather should not approach into depths of less than 7 fathoms (12^m8), sand, until the lights on the moleheads are sighted.

Tidal streams.—Currents.—Observations indicate that the tidal streams in Ensenada de Málaga run approximately 240° and 060°, with a rate of about half a knot at springs. It is reported that the 35 streams run more strongly in the vicinity of Dique del Oeste. Offshore the tidal streams are negligible compared with the currents.

On a calm day, it has been observed that, whilst near the coast the current has been west-going, about 3 miles offshore it flows in the opposite direction, which would appear to indicate that this last, 40 which is the main current of the Mediterranean, divides off the coast eastward of Málaga, one part reaching the port from an easterly direction.

The direction of the wind, the state of the sea, and that of the tide have considerable influence on the rate and direction of the current. 45 On the meridian of Málaga, the rate of the main east-going current in the offing may be considerable, *see* page 8, but that of the eddy is insufficient to affect navigation.

Chart 1848.

Puerto de Málaga.—This harbour is protected by two moles. 50 Dique del Este extends about 4 cables southward from the extremity of the promontory on which stands the suburb of Malagueta. Dique del Oeste extends about 3 cables eastward from the eastern entrance point of Rio Guadalmedina. The entrance, between the heads of these

Charts 2717, 2158a.

Chart 1848.

moles, is $1\frac{1}{2}$ cables wide, with depths of from 33 to 39 feet (10^m1 to 11^m9), and faces south-westward.

From near the root of each of the two moles a transverse mole extends, forming an inner harbour. The passage from the outer to the inner harbour is 368 feet (112^m0) wide, with depths of from 26 to 32 feet (7^m9 to 9^m8).

The four moles, together with wharves on reclaimed land, form three basins, Antepuerto, Dársena de Heredia and Dársena de Guadiaro. In Antepuerto there are depths of from 30 to 33 feet (9^m1 to 10^m1); in the other two basins there are depths of from 23 to 30 feet (7^m0 to 9^m1) and about 6,560 feet ($1,999^m5$) of quays.

Large vessels moor in Antepuerto with their sterns secured to bollards on Dique Este; they cannot lie alongside because of the rubble slope.

The western part of Antepuerto is reserved for men-of-war and vessels taking refuge.

Pilotage.—Pilotage, *see* page 20, is compulsory, with certain exceptions. Pilots can be obtained by making the usual signals. The pilots' boats are painted white with the letter P in black, and display a blue flag with the letter P in white in the centre. At night, they burn a white flare at intervals. By day, the pilot will board an incoming vessel from one to 3 miles from the port; in bad weather he will board her at the entrance to the harbour.

The pilots maintain a signal mast near the lighthouse; communication can be established by means of the International Code of Signals.

Lights.—Buoy.—A light is exhibited, at an elevation of 125 feet (38^m1), from a white, circular tower, 108 feet (32^m9) in height, situated in Bateria de San Nicolas near the root of Dique del Este (*Lat.* $36^\circ 43' N.$, *Long.* $4^\circ 25' W.$). *See* view facing page 76.

A light is exhibited, at an elevation of 42 feet (12^m8), from a circular masonry tower, 23 feet (7^m0) in height, situated on the head of Dique del Este.

A light is exhibited, at an elevation of 42 feet (12^m8), from a circular masonry tower, 23 feet (7^m3) in height, situated on the head of Dique del Oeste.

A light is exhibited, at an elevation of 22 feet (6^m7), from a circular masonry tower, 16 feet (4^m9) in height, situated on the head of each of the transverse moles.

Two lights are exhibited from conical, stone columns, 11 feet (3^m4) in height, situated one on each side of the entrance to the fishing harbour.

A mooring buoy is established in the northern part of Dársena de Guadiara for hauling vessels off the wharf on its northern side.

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at Málaga. *See* page 15.

City.—Port facilities.—Communications.—The city, which stands on each side of Rio Guadalmedina, is situated on level ground northward and westward of the harbour, and on the eastern side ascends the lower slopes of Monte de Gibralfaro and other hills. By reason of its manufactures and trade, this city is one of the busiest on the southern coast of Spain. A British Consular officer resides here.

Supplies and fresh provisions are plentiful. Water is laid on to the wharves or can be delivered in water boats.

There are several hospitals.

Charts 773, 2717, 2158a.

Chart 1848.

For deratisation, *see* page 22.

Stocks of coal and fuel oil are maintained.

Repairs can be executed and a tug is available. The port is well equipped with cranes, some of which are floating cranes. For details of the floating dock, on the south-western corner of Dársena Heredia, *see* page 486. 5

Regular steamer communication is maintained with Melilla, Buenos Ayres, Habana and New York.

Storm signals.—Storm signals, *see* page 11, are displayed at the signal station. 10

Chart 773.

COAST.—Punta de los Cantales consists of three, moderately high, rocky points; on the summit of each point stands a tower.

Arroyo de Benagalbón, about $1\frac{1}{2}$ miles eastward of Punta de los Cantales, is one of several streams which flow through a sandy beach that extends about $8\frac{1}{2}$ miles eastward from Punta de los Cantales to Punta de Vélez-Málaga. 15

Castillo del Marqués is situated about 5 miles eastward of the mouth of Arroyo de Benagalbón and is a good mark. 20

Punta de Vélez-Málaga (*Lat.* $36^{\circ} 43' N.$, *Long.* $4^{\circ} 07' W.$) is low and sandy. This point is growing seaward in consequence of the deposit brought down by the freshets of Río Ménoba. This river contains a considerable volume of water in winter, but scarcely any in summer. This point should not be approached closely. 25

Vélez-Málaga stands at an elevation of about 180 feet (54^m9), on the slope of a hill, about $3\frac{1}{2}$ miles northward of Punta de Vélez-Málaga.

Sierra Pelada or de Tejada rises to an elevation of about 7,000 feet ($2,133^m6$) some 10 miles inland, between the high Serranía de Ronda, *see* page 64, and Sierra Nevada, *see* page 78. Its many peaks are almost continually covered with snow and frequently hidden in clouds.

Anchorage.—Open anchorage can be obtained, by vessels with local knowledge, anywhere off the coast between the mouth of Arroyo de Benagalbón and Punta de Vélez-Málaga. 35

Fondeadero de Vélez-Málaga.—Light.—Torre del Mar, a suburb of Vélez-Málaga is situated on the western shore of a bay, about $1\frac{1}{4}$ miles north-north-eastward of Punta de Vélez-Málaga. An isolated factory, with a tall chimney, is situated north-eastward of Torre del Mar. A pilot is available, but pilotage, *see* page 20, is not compulsory. 40

A light is exhibited, at an elevation of 46 feet (14^m0), from a grey square tower on a white and grey base, with an aluminium lantern, 31 feet (9^m4) in height, situated at the south-western end of Torre del Mar.

Life-saving.—Life-saving appliances are maintained at Torre del Mar; *see* page 15. 45

Anchorage.—Fondeadero de Vélez-Málaga affords good anchorage, during offshore winds, to coasting vessels, in depths of about $5\frac{1}{2}$ fathoms (10^m1), sand and mud, southward of the factory. Large vessels, especially in the bad weather season, should anchor, in depths of from 10 to 11 fathoms (18^m3 to 20^m1). 50

In depths of from 7 to 9 fathoms (12^m8 to 16^m5), there are patches of hard sand, on which, during south-westerly winds, the sea rises and sometimes breaks.

Charts 2717, 2158a.

Chart 773.

Coast.—Light.—From the northern end of the beach at Torre del Mar, the coast trends about 6 miles east-south-eastward to Punta de Torrox. This stretch of coast is covered with vineyards and cane fields, and is dotted with white cottages, in addition to which there are a number of white coastguard huts and several old towers.

Pico de Zafarraya, the most notable peak of Sierra Pelada, rises to an elevation of about 7,000 feet (2,133^m6), and terminates in a sharp cone, about 9 miles north-north-eastward of Punta de Torrox. *See* 10 view facing page 69.

Punta de Torrox and the land in its vicinity are low, rising gradually inland to hills of moderate elevation. Close eastward of the point is the mouth of Rio Rilamar, on the eastern bank of which is a coastguard hut. The town of Torrox (*Lat.* 36° 45' N., *Long.* 3° 57' W.) stands in 15 an amphitheatre on the brow of a hill about 2 miles northward of the point, and is easily identified from seaward.

A light is exhibited, at an elevation of 95 feet (29^m0), from a yellow, circular tower, 75 feet (22^m9) in height, situated on Punta de Torrox.

From Punta de Torrox the coast trends about 4 miles east-north- 20 eastward to Nerja; it is high and rocky.

Torre de Catraca or Macaca is an old round tower, with a hut at its foot, situated about 1½ miles westward of Nerja.

Chart 2717, plan of Nerja anchorage.

Fondeadero de Nerja.—The town of Nerja stands on level ground 25 near the coast, and is surrounded by hills of moderate elevation covered with vineyards and hamlets. In front of the town, amidst the ruins of a castle, and about 2 cables westward of a coastguard hut, is a promenade, which can be identified from a short distance, by day, by its palm trees, and, at night, by its lights.

30 Punta del Barranco de Maro or Mazo is a high rugged point about 1½ miles north-eastward of the town, and between them the coast forms a small bay in which are some beaches, the largest of which is Playa de Burriana.

Two factories, visible from seaward, are situated, one about half 35 a mile north-westward of the town, and the other close to Playa de Burriana.

Anchorage.—Fondeadero de Nerja affords anchorage off the town, in depths of from 7 to 14 fathoms (12^m8 to 25^m6), sand.

Chart 773.

40 **Coast.**—From Punta del Barranco de Maro, the coast trends about 3½ miles eastward to Torre del Pino or del Arroyo Hondo. Along this stretch of coast are Tajo de Maro and the mouth of Arroyo Miel.

Sierra Almijara rises to an elevation of about 5,230 feet (1,594^m1), about 3½ miles northward of the mouth of Arroyo Miel.

45 Cala de los Canuelos lies close eastward of Torre Pino, and on its shore stands a coastguard hut.

Punta de Cerro Gordo or Redondo is situated about 2 miles south-eastward of Torre del Pino, and about midway between is Playa de Cantarriján.

50 **Anchorage.**—Open anchorage can be obtained in fine weather, by vessels with local knowledge, off either Tajo de Maro or the mouth of Arroyo Miel.

Small vessels, with local knowledge, can anchor in Cala de los Canuelos, in depths of about 4 fathoms (7^m3).

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Chart 2717, plan of Herradura bay.

Fondeadero de Herradura.—This small bay is entered between Punta de Cerro Gordo and Punta de la Concepción or de la Mona, about $1\frac{1}{2}$ miles south-eastward, on both of which points there is a tower. The bay is hemmed in by high, rugged hills, and at its head is a beach in the middle of which Rio Jate flows into the sea. Close eastward of the mouth of this river is the village of Herradura (*Lat. $36^{\circ} 44' N.$, Long. $3^{\circ} 45' W.$*), with a ruined castle. See view facing page 69.

Anchorage.—Fondeadero de Herradura affords anchorage off the northern shore of the bay in depths of from 10 to 14 fathoms (18^m3 to 25^m6), mud; but it is dangerous, especially in winter. Better shelter can be obtained close to the eastern and western entrance points from easterly or westerly winds, respectively.

Chart 2717, plan of Berengueles bay.

Ensenada de Berengueles.—This anchorage is approached between Punta de la Concepción and Punta de San José, about one mile north-eastward. It is surrounded by high land, with only a few very short stretches of beach, and there is no village.

Bahia Galeras is a cove on the northern side of Punta de la Concepción; Punta de San Antonio and Punta Lobo lie, respectively, about $2\frac{1}{2}$ and 6 cables north-north-eastward of that point.

Peñon de las Caballas is a high rocky islet, almost joined to the mainland, situated about one cable northward of Punta de San Antonio.

Anchorage.—Anchorage can be obtained, in depths of 14 or 15 fathoms (25^m6 or 27^m4), sand, from $1\frac{3}{4}$ to $2\frac{1}{4}$ cables eastward of 25 Peñon de las Caballas.

Coasters anchor off the beach, in depths of $5\frac{1}{2}$ or $6\frac{1}{2}$ fathoms (10^m1 or 11^m9), sand, within one cable north-eastward of Peñon de las Caballas. This anchorage, the bottom in which is mostly rocky, should only be used during offshore winds.

Chart 773.

Coast.—From Punta de San José the coast trends about $1\frac{1}{2}$ miles eastward to three rocky points forming Punta de San Cristóbal.

A reef, with a depth of $1\frac{1}{2}$ feet (0^m5), lies about one cable south-south-westward of the southern extremity of Punta de San Cristóbal, and between two islets within it are shallow passages.

Almuñécar, a town where minor repairs can be executed, stands on a hill above Punta de San Cristóbal and is backed by high mountains.

Playa de San Cristóbal and Puerta de Mar are situated on the western and eastern side, respectively, of Punta de San Cristóbal.

Fondeadero de San Cristóbal is off Playa de San Cristóbal, on which beach there is an arabesque building between two factories.

Puerta de Mar is larger than Fondeadero de San Cristóbal, and is entered between Punta de San Cristóbal and Punta de Belilla, a rocky point about three-quarters of a mile east-north-eastward.

Torre de Belilla (*Lat. $36^{\circ} 44' N.$, Long. $3^{\circ} 41' W.$*) stands on a hill close north-north-westward of Punta de Belilla.

Punta de Jesús, a rocky point on which stands Torre de la Galera or del Granizo with Castillo de la Galera close to it, lies about one mile north-eastward of Punta de Belilla. Between these points there are several short beaches, through one of which a stream flows into the sea, and off these beaches is Ensenada de Velilla or Belilla.

From Punta de Jesús the coast trends about $3\frac{1}{2}$ miles eastward to Playa de Salobreña. It is moderately high and affords no anchorage;

Charts 2717, 2158a.

Chart 773.

the only distinguishing features are Torre del Diábalo and Torre del Cambrón.

Anchages.—Fondeadero de San Cristóbal affords anchorage, 5 protected from easterly winds, in depths of 8 or 9 fathoms (14^m6 or 16^m5) off the arabesque building.

Puerta de Mar affords anchorage protected from westerly winds in depths of 8 or 9 fathoms (14^m6 or 16^m5).

Neither of the above anchorages is suitable for large vessels, especially 10 in winter.

Ensenada de Velilla or Belilla affords anchorage to vessels with local knowledge, in depths of 8 or 9 fathoms (14^m6 or 16^m5), sand and mud. In greater depths the bottom is rocky in places, and vessels are liable to drag. Coasters anchor closer inshore. During north- 15 westerly winds, this anchorage is better than either of those at Almuñecar.

Chart 2717, plan of Salobreña anchorage.

Surgidero de Salobreña.—The town of Salobreña stands near the sea at the foot of Sierra de Guájar. Near it are two factories, each 20 with a tall chimney; the western chimney is about half a cable from the beach and is prominent, while the eastern chimney is about 4 cables inland and is partly obscured by a high rugged rock, on the summit of which are the ruins of a large and ancient castle, situated at the western end of the town.

Anchorage.—Surgidero de Salobreña affords anchorage, protected 25 from easterly winds, in depths of not less than 8 fathoms (14^m0), soft mud. A good berth is westward of a detached, flat-topped rock on the beach, with the chimney of the western factory in line with a farm house on the slope of the hill behind it, bearing about 023°.

Chart 773.

Coast.—From Salobreña, the coast trends about 2 miles south-eastward to the mouth of Rio Guadalfeo, and thence about 1½ miles north-eastward to Motril, forming a projection the extremity of which is known as Punta del Rio Guadalfeo. This projection has been 35 formed by the alluvium of Rio Guadalfeo; it is steep-to and free from off-lying dangers, but is advancing southward, and should be approached with caution.

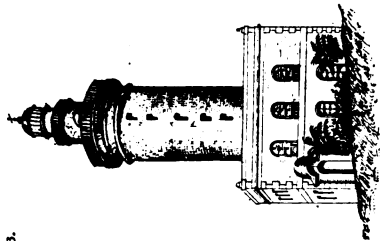
Puerto de Motril. — Lights. — Light-buoy. — Playa de Motril is divided into two parts by Punta del Rio Guadalfeo, Surgidero de 40 Salobreña, described above, and El Varadero or Playa de Motril proper, at the head of which is Puerto de Motril.

The town of Motril stands in the middle of a plain about 1½ miles northward of the port. Lead, sugar, oil, wines, &c., are exported; cereals, coal and general merchandise are imported.

The harbour is protected by the moles. Dique de Poniente extends 45 south-eastward from the beach. Dique de Levante extends south-westward from the shore to a position north-eastward of the head of Dique de Poniente. In 1949, Dique de Poniente was being lengthened. Berths have been constructed alongside either mole and on the shore- 50 ward side of the harbour, with depths of from 13 to 26 feet (4^m0 to 7^m9). In the entrance, there are depths of from 20 to 33 feet (6^m1 to 10^m1), and in the middle of the harbour of from 26 to 30 feet (7^m9 to 9^m1). The shoalest part is the north-western part of the harbour.

A light (*Lat.* 36° 43' N., *Long.* 3° 30' W.) is exhibited, at an elevation

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San Nicolas Lighthouse.

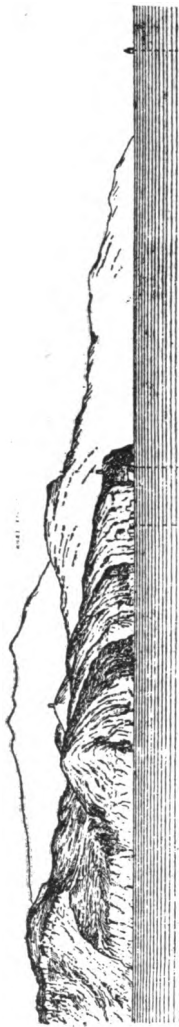
Torre
de la Yda Blanca.



Sierra de
Gata.

Cabo de Gata
lighthouse, bearing
092°, 10 miles.

Cabo de Gata from westward.



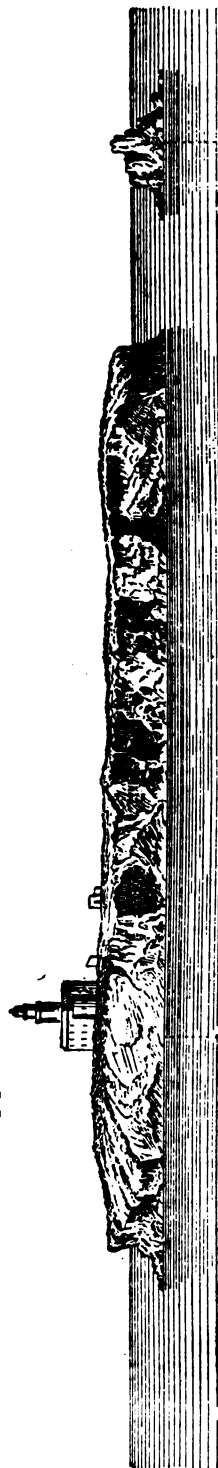
Torre del
Melonar.

Cala
Honda.

Castillo
de Carhuna
in line with
Torre del
Zampallón
bearing 074°.

Punta de Carhuna
disused lighthouse.

Approach to Cala Honda from west-south-westward.



Landing
place.

Isla de Alborán from south-eastward.
(Originals dated 1893.)

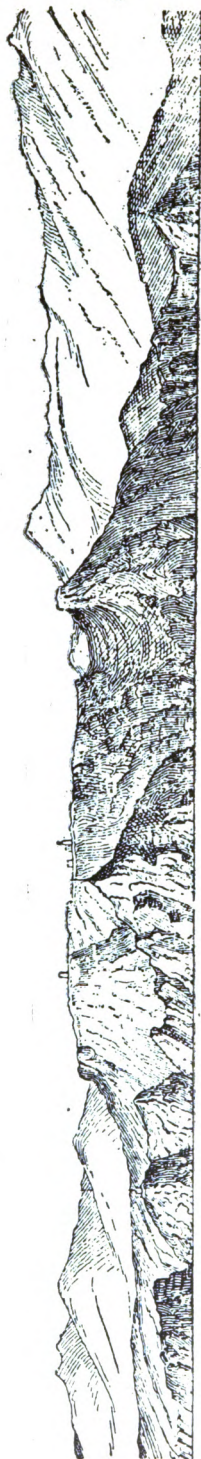
Isla de la
Nube.

Torre de la Mesa.
Mesa de Roldán
lighthouse,
bearing 015°, 4 miles.



La Mesa de Roldán from south-south-westward.

Sierra Cabrera.



Punta de los Muertos.

Mesa de Roldán
lighthouse,
bearing 330°, 3 miles.

La Mesa de Roldán from south-south-eastward.



Monte de las Águilas.

Monte Cope, bearing
278°, 16 miles.

Monte Cope from eastward.
(Originals dated 1898.)

Chart 773.

of 23 feet (7^m0), from a green, iron, pyramidal tower, 16 feet (4^m9) in height, situated on the head of Dique de Levante.

A light is exhibited, at an elevation of 26 feet (7^m9), from a red, iron, pyramidal tower on a square base, 21 feet (6^m4) in height, situated on the head of Dique de Poniente. In 1950, this light was extinguished. 5

A conical light-buoy, painted red and exhibiting a *red group flashing* light, showing *two flashes every ten seconds*, is moored about 130 yards (118^m9) from the visible head of Dique de Poniente. Vessels should pass eastward of this light-buoy. 10

Pilotage is compulsory, *see* page 20. The usual signal should be made about one mile from the port. The pilot boat flies a white flag with the letter P in black in the centre.

Anchorage.—Since the construction of Puerto de Motril, little use is made of the roadstead. The part eastward of the port is shoal and is fringed with breakers. The best berth is about one-quarter of a mile from the entrance to the harbour, in depths of about 8 fathoms (14^m6), mud. 15

Port facilities.—The port is equipped with cranes, and lighters are available. Water is laid on to the wharves. A stock of coal is maintained. There is a hospital in Motril. Coasting steamers call regularly. 20

Coast.—Light.—From Puerto de Motril, the coast, formed by a beach, trends about 3 miles south-eastward to Cabo Sacratif.

Torre Nueva stands near the coast, in a village at the foot of Cerro del Aire, about 1½ miles south-eastward of Puerto de Motril. 25

Cabo Sacratif is a rocky headland of moderate elevation and is easily identified. It is the extremity of the south-western spur of Sierra de Jolúcar, which rises to an elevation of 2,765 feet (842^m8) about 3½ miles north-eastward of the cape. On the cape in addition to the lighthouse are the ruins of Torre del Chucho. *See* views facing page 69. 30

A light is exhibited, at an elevation of 320 feet (97^m5), from a reddish, circular tower, 56 feet (17^m1) in height, with a dwelling attached, situated on the summit of Cabo Sacratif. 35

A sand spit, with a depth of 6½ fathoms (12^m3) over its extremity, extends about half a mile south-eastward from the western extremity of the cape, whence it fringes the coast eastward. Halfway between the extremity of the spit and the coast there are depths of less than 2 fathoms (3^m7). In 1937, a vessel grounded on this spit half a mile offshore. Vessels should not approach Cabo Sacratif within one mile. 40

Strong currents, usually east-going, are experienced off Cabo Sacratif (Lat. 36° 41' N., Long. 3° 28' W.).

Playa de Carchuna extends about 2½ miles eastward from Cabo Sacratif to Punta del Llano or de Carchuna, and within it is Llano de Carchuna. About 1½ miles eastward of Cabo Sacratif and half a cable inland, stands Castillo de Carchuna, a dismantled fort now used as a coastguard station. Close westward of the fort is a reef which lies parallel with the coast and about one cable from it. 45

Chart 2717, plan of Cala Honda.

Cala Honda.—Torre del Zambullón, or de Cala Honda, stands on a point, about 150 feet (45^m7) high, about three-quarters of a mile north-eastward of Punta del Llano. *See* view facing page 76. 50

Cala Honda is a cove on the western side of the above-mentioned

Charts 2717, 2158a.

Chart 2717, plan of Cala Honda.

point, and between it and Punta del Llano the coast is formed by the eastern side of Llano de Carchuna. On the eastern side of the cove, about $1\frac{1}{2}$ cables north-westward of Torre del Zambullón, is a steep islet, separated from the coast by a narrow channel which is foul. On the western side of the cove stands a village.

Anchorage.—Small vessels, of about 100 tons, can moor in Cala Honda, with their sterns secured to the shore ; but local knowledge is essential.

10 During westerly or northerly winds, larger vessels can anchor off the coast between Punta del Llano and Cala Honda, in depths of from 14 to 16 fathoms (25^m6 to 29^m3), about one cable offshore.

Chart 773.

Coast.—From the point on which stands Torre del Zambullón, the 15 coast trends about $2\frac{1}{2}$ miles east-north-eastward to Punta del Melonar or de la Estancia, and is somewhat indented and moderately high.

Cala Arreyana is entered about midway between Torre del Zambullón and Punta del Melonar, and available to coasters in fine weather only.

20 Sierra de Jolúcar, *see* page 77, dominates this stretch of coast, and from it a spur descends south-eastward to Punta del Melonar.

Gualchos is a town standing, at an elevation of 1,063 feet (324^m0), about $2\frac{1}{2}$ miles north-north-westward of Punta del Melonar. It stands in a steep-sided ravine, like an amphitheatre, and is a prominent 25 landmark, as it is the only town in the vicinity, and shows up well against its dark background.

Sierra Nevada, a continuation of Sierra Pelada, *see* page 73, extends parallel with the coast and about 20 miles inland, as far eastward as Golfo de Almeria, *see* page 82. These mountains are the highest in 30 Spain and are covered with perpetual snow. The most remarkable summits are Pico Veleta, 11,385 feet ($3,470^m0$) high, and Pico Mulahacen, 11,552 feet ($3,481^m0$) high. *See* chart 2717.

Chart 2717, plan of Ferro Castel anchorage.

Fondeadero de Castel de Ferro.—Punta del Melonar (*Lat.* 35 $36^{\circ} 43' N.$, *Long.* $3^{\circ} 21' W.$) is a high steep point, above which stands Torre del Melonar. *See* views facing pages 69 and 76.

Playa de la Rambla, through which a stream flows into the sea, is situated between Punta del Melonar and a small hilly point about three-quarters of a mile north-eastward. Between this latter point 40 and a similar one further north-eastward, is a short beach ; further in the same direction is Playa de Cambriles, another short beach. On the hill between these two beaches stand the ruins of Torre de Cambriles.

Castel de Ferro crowns a small steep-sided hill, $1\frac{1}{2}$ cables inland, 45 about 3 cables south-westward of Torre de Cambriles.

The village of Castel de Ferro is situated at the foot and on the eastern side of the hill on which stands the castle. It is the port of Gualchos.

Anchorage.—Fondeadero de Castel de Ferro affords anchorage, 50 sheltered from north-westerly winds, in depths of from 8 to 11 fathoms (14^m6 to 20^m1), soft mud, eastward of the village. Squalls sometimes blow heavily down the ravines, and, as the bottom is steep and the holding ground poor, vessels are liable to drag.

Coast.—**Light.**—From the north-eastern end of Playa de Cam-

Charts 2717, 2158a.

Chart 2717, plan of Ferro Castel anchorage.

briles, the coast trends about $6\frac{1}{2}$ miles east-north-eastward to Punta Negra. It is high and rugged, but is free from dangers except close inshore. On it are three towers, named, from west to east, Torre de los Baños, Torre de la Mámola, and Torre de Melisena. 5

Punta Negra is so named from the dark colour of the land in its vicinity, and on it stands a ruined tower.

The village of La Rábita stands about 2 miles eastward of Punta Negra, on a small plain at the foot of a hill on the summit of which is a castle. Fronting La Rábita is a short stretch of beach. 10

Charts 773 and 774.

From La Rábita, the coast trends about 7 miles eastward to Adra ; it is high, rugged, steep-to and free from dangers, with the exception of a few rocks lying close inshore. In this stretch of coast there are only a few beaches. 15

At Playa de la Juana, about $2\frac{1}{2}$ miles eastward of La Rábita, there is a small fishing village. At Playa de la Alcazaba, $1\frac{1}{2}$ miles farther eastward, stands a coastguard hut. At Playa del Lance de la Virgen, 2 miles eastward of the coastguard hut, stands another small village.

Torre de Guainos stands on a hill between Playa de la Alcazaba and Playa del Lance de la Virgen. Close northward of this tower stands the village of Guainos Alto, and on the beach below that of Guainos Bajo. 20

A light is exhibited, at an elevation of 121 feet (36^m9), from a yellow tower, 42 feet (12^m8) in height, situated about 2 miles eastward of Torre de Guainos and one mile westward of Adra. 25

Chart 2717, plan of Adra anchorage.

Puerto de Adra.—Lights.—Adra consists of two parts, the old town and the modern. The latter is situated near the beach and the former on the summit of a hill nearby. Lead, fruit, &c., are exported. The supply of water is very limited. Minor repairs can be executed. 30

Torre de los Perdigones (*Lat. $36^{\circ} 45' N.$, Long. $3^{\circ} 01' W.$*) stands on an eminence, 82 feet (25^m0) high, at the western end of the town. This tower can be easily identified from the towers and chimneys in its neighbourhood, because it is in the shape of a truncated cone, 131 feet (39^m9) high, and its lower third is white while the upper two-thirds are brick-coloured. 35

The harbour is protected by two rubble moles. Dique de Poniente extends about $3\frac{1}{4}$ cables southward and south-eastward ; on the harbour side of the inner part is a wharf, 858 feet (260^m0) long, with depths of from 16 to 23 feet (4^m9 to 7^m0) alongside. Dique de Levante extends about one cable south-south-westward and, in 1949, work was in progress extending it. In 1950, it was reported that there were depths of 17 feet (5^m2) in the entrance, and that only vessels less than 200 feet (61^m0) in length, drawing less than 16 feet (4^m9), could enter the harbour. 45

Pilotage, *see* page 20, is compulsory.

A light is exhibited, at an elevation of 26 feet (7^m9), from a post, 13 feet (4^m0) in height, situated near the head of Dique de Poniente. This light is moved as the work of extension progresses. 50

A light is exhibited near the head of Dique de Levante.

Two mooring buoys are situated off Dique de Poniente to assist vessels hauling off the wharf.

Outside Dique de Poniente, the silt of the sea has formed an extensive beach. 55

Charts 2717, 2158a.

Chart 2717, plan of Adra anchorage.

Anchorage.—There is anchorage off Adra, in depths of about 8 fathoms (14^m6), hard mud, about one cable off the outer part of Dique de Poniente. This anchorage is sheltered from north-easterly and north-westerly winds, and the holding ground is mostly good. With onshore winds this anchorage is dangerous.

Chart 774.

Coast.—Caution.—From Dique de Levante at Adra, the coast trends about one mile eastward and south-eastward to the mouth of Rio Adra. This river rises in Sierra Nevada and near its mouth is liable to change its course. About 2 miles eastward of this mouth, the action of the sea has formed a narrow creek, known as El Portezuelo, near which are two small lagoons.

Torre de Aljamilla lies about 1½ miles eastward of El Portezuelo, and from abreast it the coast, consisting of a low, sandy beach near which are some strong patches, trends about 5 miles south-eastward to Punta de los Baños.

Dalías, a town about 5 miles north-north-eastward of Torre de Aljamilla, shows up well from seaward against a dark mountainous background.

Torre de Belerma or Balerma (*Lat. 36° 43' N., Long. 2° 54' W.*) stands on the coast, about 2½ miles south-eastward of Torre de Aljamilla, in the middle of a large fishing village.

Llanos de Almeria, also known as Campo de Dalías, is a low plain which, beginning near Torre de Aljamilla, extends eastward to the western shore of Golfo de Almeria. Northward, it is bounded by Sierra de Gádor, *see* page 82, and other hills.

Caution is necessary in estimating the distance from the seaward edge of this plain, as, owing to its blending with the horizon and being backed by high land, its apparent distance is often misleading.

Anchorage.—El Portezuelo affords excellent shelter, from both easterly and westerly winds, to vessels of moderate draught with local knowledge, but it is subject to considerable alteration.

Anchorage can be obtained, with offshore winds, in a depth of about 6½ fathoms (11^m9), sand, about 4 cables west-south-westward of Torre de Belerma, in a small bight on the coast.

Coast.—Dangers.—Light.—Between Punta de los Baños and Punta del Moro, the south-western extremity of Llanos de Almeria, about 6½ cables north-westward, the coast is low and rocky. Punta del Moro is low, rocky and foul; about half a cable south-eastward of it there is a large rock.

Castillo de Guardias Viejas, a disused fort, stands on a steep hillock about 4 cables east-north-eastward of Punta del Moro, and near it is the village of Los Baños; about half a cable northward of the castle, and at a slightly higher elevation, is a coastguard station.

From Punta de los Baños, the coast trends about three-quarters of a mile east-north-eastward to two small lagoons; near these lagoons are some salt works with a small pier. From the eastern end of the lagoons, the low sandy coast trends about 2½ miles south-eastward to Punta de las Entinas.

Between Punta de los Baños and Punta de las Entinas the coast forms a shallow bay, which is encumbered with rocks, on which the sea breaks during onshore winds for a considerable distance offshore.

Culo de Perro is a reef within one mile southward of Punta de los

Charts 2717, 2158a.

Chart 774.

Baños, which has a depth of 13 feet (4^m0). The lighthouse on Punta del Sabinal, *see* below, bearing less than 088°, and open southward of the coastguard hut on Punta de las Entinas, leads southward of Culo de Perro.

5

Several other huts, besides the coastguard hut, stand on Punta de las Entinas. This point takes its name from some "entinas" or shoals formed by seaweed which grows from the bottom and comes to the surface, and which are separated by narrow channels. Shoals, with depths of 1½ and 4½ fathoms (3^m2 and 8^m7), lie, respectively, about three-quarters of a mile south-eastward and one mile south-south-eastward of the point. A shoal, with a depth of 1½ fathoms (3^m2), was reported, in 1948, to exist about 2 miles east-south-eastward of Punta de las Entinas.

10

Punta del Sabinal lies about 3½ miles eastward of Punta de las Entinas. The coast about midway between these points is low, sandy and fairly steep, but several rocks lie close inshore. A shoal bank extends as much as half a mile offshore between the points. In 1942, a shoal, with a depth of 3 fathoms (5^m3), was reported to lie about three-quarters of a mile southward of Punta del Sabinal.

20

A light is exhibited, at an elevation of 105 feet (32^m0), from a white, circular tower on a white, one-storied, square dwelling situated on Punta del Sabinal. About 2 cables westward of the lighthouse stands a coastguard hut.

Fishing nets are laid out periodically in the neighbourhood of Punta del Sabinal.

Punta Elena lies about 2½ miles east-north-eastward of Punta del Sabinal, and the coast between is sandy. Punta Elena is flat and a short distance westward of it stands Torre de los Cerrillos, a round tower which has a coastguard hut about 2 cables northward of it; close eastward of this tower is the mouth of Arroyo de los Cerrillos.

Laja del Palo is situated at the eastern end of Llanos de Almeria about 1½ miles east-north-eastward of Torre de los Cerrillos.

Chart 2717, plan of Alboran island.

ISLA DE ALBORÁN.—Light.—This island, which belongs to Spain, lies about 49 miles southward of Adra, and about 30 miles northward of Cabo Tres Forcas, *see* page 274. It is flat, reddish and about 65 feet (19^m8) high. The cliffs on its southern side are steep, but they are less so on the northern side. *See* view facing page 76.

A light (*Lat.* 35° 56' N., *Long.* 3° 02' W.) is exhibited, at an elevation of 115 feet (35^m0), from a grey circular tower on a grey dwelling, 62 feet (18^m9) in height, situated near the south-western extremity of Isla de Alborán.

Islote de la Nube lies about three-quarters of a cable north-eastward of Punta del Islote, the north-eastern extremity of the island.

45

Both the island and islet are fringed with sunken rocks extending as much as one cable offshore.

Punta del Desembarcadero and Punta de Poniente are the southern and western extremities, respectively, of the island.

A depth of 4 fathoms (7^m3) is situated about 1½ cables east-south-eastward of Punta del Desembarcadero.

Anchorage.—Temporary anchorage, affording some shelter from westerly and north-westerly winds, can be obtained from 2½ to 3½ cables

Charts 773, 2437, 2717, 2158a.

Chart 2717, plan of Alboran island.

eastward of Isla de Alborán lighthouse, in depths of from 9 to 11 fathoms (16^m3 to 20^m1). Caution should be exercised, for depths of less than 5 fathoms (9^m1) were at one time reported to exist within 3 cables of the south-eastern side of the island.

Landing can be effected in a cove, with a sandy beach, close eastward of the lighthouse. There is a smaller cove westward of the lighthouse.

Currents.—Strong east-going and south-east-going currents are experienced in the vicinity of Isla de Alborán, and caution should be exercised in thick weather.

Submarine cables.—Submarine telegraph cables, *see* page 19, are landed in the first of the above-mentioned coves, and are laid through the anchorage. They are unmarked and care must be taken to avoid them.

15 *Chart 774.*

GOLFO DE ALMERIA.—This bay is entered between Laja del Palo and Cabo de Gata, about 21 miles eastward; at its head stand the city and port of Almeria. Its shores are free from off-lying dangers, and can be safely approached. Westward of the city the shore is cliffy, but eastward of the city it is low and flat.

The best mark for the bay is Sierra de Gádor, *see* page 80, which attains an elevation of 7,630 feet (2,325^m0), with Las Hermanicas, 6,896 feet (2,101^m9) high, close southward of it. Culataivi, a 4,550-foot (1,386^m8) summit, about 12 miles north-eastward of Almeria, is also a useful mark.

Western shore.—**Light.**—The ruined Castillo de Roquetas or de Santa Ana lies close to the shore about 3 miles north-north-eastward of Laja del Palo. It stands in the centre of the extensive suburb of El Puerto. Between El Puerto and Laja del Palo is a stretch of low marshy land on which are some salt pans and several hamlets. On the esplanade in front of the ruin is a warehouse. A mole extends about 370 yards (338^m3) north-north-eastward from abreast the warehouse.

Roquetas de Mar light (*Lat.* 36° 45' N., *Long.* 2° 37' W.) is exhibited, at an elevation of 24 feet (7^m3), from a black iron tower, situated on the head of the mole.

The town of Roquetas is situated about half a mile north-north-westward of Castillo de Roquetas.

Torre de los Bajos, about 2 miles north-north-eastward of Castillo de Roquetas, is in ruins; near it stands a coastguard hut. A reef extends a short distance from the shore close to the tower.

Torre de Rambla-honda and Torre de la Garrofa stand, respectively, about 1½ miles north-north-eastward and 4½ miles north-eastward of Torre de los Bajos. Torre de la Garrofa stands on a high rugged point, and near it are some huts, one of which is a coastguard hut.

Anchorage.—There is anchorage, sheltered from westerly winds off the coast between Castillo de Roquetas and Torre de los Bajos. A good berth is about one mile offshore, in depths of 16 fathoms (29^m3), coarse sand, with the castle bearing about 247°. Vessels of light draught can anchor close inshore, avoiding a rocky patch, with a depth of 9 fathoms (16^m5), about 6 cables north-eastward of the castle.

Chart 1588, plan of Almeria road.

Rada de Almeria.—**Light-buoy.**—This roadstead is entered

Charts 773, 2437, 2717, 2158a.

Chart 1588, plan of Almeria road.

between Punto del Torrejón and Punta del Rio Andarax, a sandy point at the mouth of Rio Andarax or de Almeria, about 3 miles east-south-eastward.

Castillo de San Telmo stands on Punta del Torrejón and is a coast-guard station. 5

On the north-western side of the city of Almeria is the ancient citadel, standing on a flat-topped, steep-sided hill, over 200 feet (61^m0) high. It shows up well from seaward and in it there is a framework radio mast. 10

Rio Andarax rises in Sierra Nevada, *see* page 76, but is always dry in summer; except after heavy rains it is always quite a small stream. The annual freshets have formed the point referred to above and subject it to alteration, but the action of the sea soon reduces it to its normal extent. 16

A can light-buoy, painted black and exhibiting a *green flashing* light about *every second*, *see* chart 774, is moored off Punta del Rio Andarax.

Submarine cable.—A submarine telegraph cable, *see* page 19, the route of which is indicated by a wavy line on the chart, is landed at a cable hut near Zapillo coastguard hut about one mile north-westward of the mouth of Rio Andarax. 20

Anchorage.—Anchorage can be obtained in Rada de Almeria. The best berth is, in depths of 10 or 11 fathoms (18^m3 or 20^m1), south-westward of the head of Dique de Poniente, *see* below.

Puerto de Almeria.—**Lights.**—This harbour is protected south-westward by Dique de Poniente, on the inner side of the western part of which is a wharf, alongside which, in 1943, there were depths of from 20 to 35 feet (6^m1 to 10^m7). The outer part of the mole is built of rubble and on it are bollards. A vessel anchoring in this harbour and securing its stern to the bollards must use caution as large blocks of concrete lie, in places, as much as 50 yards (45^m7) from the centre line of the mole. 25 30

A light (*Lat.* 36° 49' N., *Long.* 2° 27' W.) is exhibited, at an elevation of 49 feet (14^m9), from a white circular tower attached to a white, single-storied building, 36 feet (11^m0) in height, situated on the head of Dique de Poniente. In 1948, this light was reported to be irregular. 35

Dique de Levante extends from the shore at right angles to Dique de Poniente, to a position about 2½ cables north-westward of the head of the latter. In 1943, there were depths of from 25 to 30 feet (7^m6 to 9^m1) alongside its north-western side. 40

A light is exhibited, at an elevation of 39 feet (11^m9), from an iron turret, 10 feet (3^m0) in height, situated on the head of Dique de Levante.

In 1943 there were depths of from 14 to 22 feet (4^m3 to 6^m7), alongside the wharf fronting the city.

There are several mooring buoys in the harbour. 45

Two mineral wharves, Alquife No. 1 and Alquife No. 2, extend from the shore about three-quarters of a cable and ¾ cables, respectively, south-eastward of Dique de Levante.

A light is exhibited, at an elevation of 65 feet (19^m8), from a red circular, iron structure, 59 feet (18^m0) in height, situated on the head of Alquife No. 1. 50

A light is exhibited, at an elevation of 46 feet (14^m0), from a dark red, square, wooden structure, 33 feet (10^m1) in height, situated on the head of Alquife No. 2.

Charts 774, 2717, 2158a.

Chart 1588, plan of Almeria road.

Alquife No. 1 had, in 1943, depths of 29 feet (8^m8) alongside its head, of from 8 to 29 feet (2^m4 to 8^m8) alongside its western side and of 12 to 29 feet (3^m7 to 8^m8) alongside its eastern side. Alquife No. 2 had, in 1943, depths of 28 feet (8^m5) alongside its head.

A small harbour for fishing boats was under construction, in 1945, on the western side of the root of Dique de Poniente.

City.—Port facilities.—Communications.—The city of Almeria stands on the south-eastern slope of Sierra de Félix, which is a spur of Sierra de Gádor, *see chart 774*.

Grapes, esparto grass, and other agricultural products, together with iron, silver, lead and zinc ores, are exported.

Fresh provisions and water can be obtained. Small stocks of coal and fuel oil are maintained; the oiling berth is at the south-eastern end of Dique de Poniente wharf. Repairs can be executed. There are several travelling cranes of 5-tons capacity and one crane of 25-tons capacity. A number of lighters are available.

Pilotage, *see page 20*, is compulsory.

For deratisation, *see page 22*.

There is regular steamer communication with Melilla, Islas Canarias, Marseille, and South America.

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at Almeria. *See page 15*.

Chart 774.

Eastern shore.—Caution.—From Punta del Rio Andarax, the eastern shore of Golfo di Almeria trends about 3½ miles north-eastward to Torre Perdigal, and thence about 11½ miles south-eastward to Cabo de Gata.

There are coastguard stations at Torre del Bobar, about three-quarters of a mile from Punta del Rio Andarax, and at Torre Perdigal (Lat. 36° 50' N., Long. 2° 22' W.).

Casa Fuerte, Torre Garcia and Torre de San Miguel stand on the shore about 2 miles eastward, 3½ miles east-south-eastward and 7½ miles south-eastward, respectively, of Torre Perdigal. Near Torre Garcia is a coastguard hut, and near Torre de San Miguel is a village, about half a mile south-eastward of which a stream flows into the sea.

Tunny fishing, *see page 27*, is carried on annually from March to June about 1½ miles south-south-eastward of Torre Garcia and about 3 miles south-south-eastward of Torre de San Miguel.

A conspicuous, white, square, fishery lookout tower, with windows, near which stands a dwelling, is situated near the shore about 2½ miles south-eastward of Torre de San Miguel.

Fondeadero de los Corraletes lies off a clear sandy beach that extends from Torre de San Miguel to Punta de la Testa, about 3½ miles south-eastward.

Chart 2717, plan of Cape de Gata.

A cove, at the head of which lies Playa del Corralete, is entered between Punta de la Testa and Cabo de Gata, about 7 cables south-eastward.

Chart 774.

Anchorage.—Anchorage, sheltered from easterly winds, can be obtained off Torre de San Miguel, but it is not so good as that in Fondeadero de los Corraletes.

Anchorage, sheltered from easterly winds, can be obtained in

Charts 2717, 2158a.

Chart 774.

Fondeadero de los Corraletes, care being taken to avoid the tunny nets.

Both these anchorages are exposed to south-westerly winds.

Chart 2717, plan of Cape de Gata.

5

Small vessels, with local knowledge, can obtain anchorage off Playa del Corralete, in depths of 7 or 8 fathoms (12^m8 or 14^m6), sand and weed.

COAST. — Light. — Dangers. — Currents. — Cabo de Gata is the termination of a spur of the rugged Sierra de Gata, and close off it lie an islet and many rocks. *See* views on chart 2717 and facing page 76.

A light is exhibited, at an elevation of 194 feet (59^m1), from a white, circular tower, 59 feet (18^m0) in height, situated on Cabo de Gata.

A rock, with a depth of 10 feet (3^m0), lies about 6½ cables south-south-eastward of Cabo de Gata lighthouse. No attempt should be made to pass between this rock and the cape; the latter should be given a wide berth (*Lat.* 36° 43' N., *Long.* 2° 11' W.).

Strong currents, usually setting eastward or south-eastward, are experienced off Cabo de Gata; but they are influenced by the winds. 15

Torre de Vela Blanca stands on a headland, about 1½ miles eastward of Cabo de Gata. At the foot of this headland there is a remarkable white patch, resembling a vessel under sail. 20

Chart 774.

Between Cabo de Gata and Isleta de Carboneras, 22 miles north-north-eastward, *see* page 87, the coast is high, and presents a number of summits of medium elevation separated by ravines descending to the sea and forming bays or coves, at the heads of most of which are sandy beaches, and in which small craft, with local knowledge, can obtain shelter from north-westerly winds. It is free from off-lying dangers, and may be approached to a prudent distance. 30

Playa de Monsú is a short stretch of sandy beach in the steep rugged coast, about one mile eastward of Torre de Vela Blanca, through which runs a stream and near which is a coastguard hut.

Chart 2717, plan of Port Genovés, etc.

35

Puerto Genovés.—This cove, about 4 miles eastward of Cabo de Gata, is open eastward and has depths of less than 5 fathoms (9^m1), sandy mud and ooze; the beach is free from dangers and the slope is gradual.

Morro Genovés, the southern entrance point of the cove, is a promontory, 269 feet (82^m0) high, of conical shape somewhat flattened at its summit. 40

Anchorage.—Anchorage, sheltered from winds northward of south-west, can be obtained off Puerto Genovés, in depths of 6 or 7 fathoms (11^m0 or 12^m8). The best berth is about 3 cables northward of the northern extremity of Morro Genovés. Fresh westerly winds cause squalls to rush down from the hills and the anchorage then becomes indifferent. Small craft, with local knowledge, can obtain shelter in Puerto Genovés, in depths of from 5½ to 6½ fathoms (10^m1 to 11^m9). 45

Ensenada de San José.—This bay is separated from Puerto Genovés by a promontory, on a hill at the eastern extremity of which stands the partly ruined Castillo de San José de los Genoveses, with a coastguard station close to it. 50

Chart 2717, plan of Port Genovés, etc.

Playa de los Muertos is a sandy beach at the head of Ensenada de San José, and near the middle of it is the village of San José.

Cala Figuera is a cove in the north-eastern part of Ensenada de San José.

Torre de Cala Figura stands on a cliff close north-eastward of the north-eastern entrance point of Ensenada de San José.

Anchorage.—Ensenada de San José affords much the same shelter as Puerto Genovés (*Lat. 36° 44' N., Long. 2° 07' W.*). The best berth is north-north-eastward of the castle in depths of from $5\frac{1}{2}$ to $6\frac{1}{2}$ fathoms (10^m1 to 11^m9), sand.

Small vessels with local knowledge can obtain shelter from north-easterly winds, in depths of about 7 fathoms (12^m8), weed, off Cala Figuera.

Coast.—From the north-eastern entrance point of Ensenada de San José, the steep, cliffy coast trends about 2 miles north-eastward to Punta de Loma Pelada, and thence about $1\frac{1}{4}$ miles northward to the southern entrance point of Ensenada de los Escullos. A coastguard hut stands on Punta de Loma Pelada.

Los Frailes del Cabo de Gata are two conical mountains that rise to elevations of about 1,700 feet (518^m2) about one mile north-westward of Punta de Loma Pelada, and show up well from eastward or westward.

Chart 2717, plan of Escullos bay.

Ensenada de los Escullos.—This bay is entered between Escullo Grande, about $1\frac{1}{4}$ miles northward of Punta de Loma Pelada, and Punta de la Isleta, about one mile north-north-eastward.

Escullo Grande, with Escullo Chico about one cable south-south-westward of it, lies close inshore about 2 cables south-south-eastward of Punta del Esparto.

Castillo de San Felipe is a ruin standing on a cliff of moderate elevation about 2 cables northward of Punta del Esparto, and close northward of it is a coastguard hut.

Playa de los Escullos is a sandy beach at the head of the bay northward of the castle. Close off Punta de la Isleta is an islet.

Anchorage.—Anchorage, sheltered from westerly and south-westerly winds, can be obtained anywhere in Ensenada de los Escullos according to draught. A large vessel can anchor about half a mile eastward of the ruins of the castle, in a depth of 12 fathoms (21^m9), coarse sand.

Chart 774.

Coast.—From Punta de la Isleta the coast trends about 3 miles north-eastward to Punta de la Polacra, and thence about 3 miles northward to Punta de las Negras. Southward of Punta de la Polacra, the coast is high, steep and rugged.

Isleta del Moro lies close inshore, on the southern side of Punta de la Polacra, and might be mistaken for a vessel under sail.

Cerro de los Lobos rises above Punta de la Polacra, and on its summit is a watch tower.

Ensenada de Rodalquilar, about one mile northward of Punta de la Polacra, is one of several coves northward of the point. Small craft, with local knowledge, can obtain anchorage in the cove, but it is exposed to easterly winds. A disused fort stands on a plain at a short distance from the beach.

Charts 2717, 2158a.

Chart 2717, plan of S. Pedro bay.

Fondeadero de San Pedro.—This bay is entered between Punta de las Negras and Punta de la Isleta, about $1\frac{1}{2}$ miles north-eastward. The shores of the bay are high, steep, and cliffy, and the only landing place is on Playa de las Negras, at its head.

Castillo de San Pedro (*Lat. $36^{\circ} 54' N.$, $Long. 1^{\circ} 59' W.$*) stands on an eminence in the village of Níjar at the head of the bay, close below it is a coastguard hut.

La Isleta lies about one cable south-south-eastward of Punta de la Isleta, and is steep-to on its landward side. The channel between the islet and the point should not be attempted without local knowledge.

Anchorage.—Fondeadero de San Pedro affords anchorage to small vessels about $2\frac{1}{2}$ cables southward of the castle in depths of about 6 fathoms (11^m0), sand. South-easterly winds seldom blow home to the anchorage.

Large vessels should avoid this bay, especially in winter, as south-westerly winds, which blow from time to time, often blow very strongly.

Chart 774.

Coast.—Light.—From Punta de la Isleta the coast trends about 3 miles north-north-eastward to Cala de Agua Amarga, and thence about $1\frac{1}{2}$ miles eastward to Punta de Media Naranja. Except in the above-mentioned cove, the coast is high, but in it are several coves available to small craft with local knowledge.

Cala de Agua Amarga affords shelter to small craft from easterly winds, but is open south-eastward. In the cove is a coastguard hut, near which is the village of Agua Amarga. An iron pier, which is connected by a railway with the mines at Lucarnena de las Torres, extends from the shore of this cove, and from it iron ore is exported. Mooring-buoys are established off the pier, and vessels load lying at right angles to the pier and secured to the buoys. Fronting the village, and almost in the middle of the cove, is a shoal, which has a depth of 16 feet (4^m9), about one cable offshore; but it is not dangerous to vessels approaching the pier.

La Mesa de Roldán is a high tableland between Punta de Media Naranja and Punta de los Muertos, about $1\frac{1}{2}$ miles north-north-eastward. This tableland is surmounted by the ruins of a fort, eastward of which stands a lighthouse; *see* views facing page 77.

A light (*Lat. $36^{\circ} 56' N.$, $Long. 1^{\circ} 55' W.$*) is exhibited, at an elevation of 728 feet (221^m9), from a white, octagonal tower, 65 feet (19^m8) in height, situated on the summit of La Mesa de Roldán.

Golfo de Vera is entered between La Mesa de Roldán and Monte Cope, *see* page 92, about 36 miles north-eastward. The shores of this bay are backed by Sierra Cabrera, Sierra Almagrera and other ranges of less importance.

Chart 2717, plan of Carboneras bay.

Fondeadero de Carboneras.—Isleta de Carboneras, or de San Andrés, lies at the northern end of this anchorage, about 3 cables south-eastward of a sandy point, and about $2\frac{1}{2}$ miles northward of Punta de los Muertos. This islet is situated on a shoal bank, which extends from the above-mentioned sandy point for a short distance beyond the islet. Close southward of the sandy point is a smaller islet from which the shoal bank extends about 2 cables southward. This bank is liable to be shifted by easterly or south-easterly gales.

Castillo de San Andrés, or de Carboneras, is a coastguard station

Charts 2717, 2158a.

Chart 2717, plan of Carboneras bay.

situated about half a mile north-westward of Isleta de Carboneras. Near the castle is the fishing village of Carboneras.

Anchorage.—Fondeadero de Carboneras affords anchorage sheltered from south-westerly and westerly winds. A good berth is, in depths of 18 fathoms (32^m9), sand, about one mile south-eastward of the castle, or the same distance from Isleta de Carboneras, with that islet in line with Torre del Rayo, *see* below, bearing about 012°. Small vessels can anchor closer inshore.

10 Chart 774.

Coast.—Punta del Rayo, high, rugged and surmounted by Torre del Rayo, is situated about one mile northward of Isleta de Carboneras.

Rio de Alias, or de Carboneras, flows only after rains; its mouth is in a sandy beach about 3 miles northward of Punta del Rayo, and
15 about 1½ miles southward of it is a coastguard hut; at a short distance south-westward of this coastguard hut is a large house.

Torre del Peñon stands on a low promontory about one mile northward of the mouth of Rio de Alias.

Torre de Macenas is a small dismantled fort, with a coastguard hut
20 near it, about three-quarters of a mile northward of Torre del Peñon, and northward of it the coast is comparatively low.

Punta del Cantal, close to which is a coastguard hut, is a rocky, but not very salient point, about 2½ miles northward of Torre de Macenas.

Playa de Macenas extends from Torre del Peñon to Punta del Cantal.
25 This stretch of coast is backed by several ranges of hills, and is fringed in places by rocks, which dry. About one mile northward of Torre de Macenas is a group of farm buildings, the only other buildings along this stretch of coast being the ruins of abandoned mine workings.

Between Punta del Cantal and Villaricos, about 8 miles northward,
30 the coast is sandy, and through it several streams flow into the sea.

Mojácar (*Lat. 37° 08' N., Long. 1° 51' W.*), about 1½ miles north-westward of Punta del Cantal, is a town standing about one mile inland, on the crest of a low hill at the eastern end of Sierra Cabrera.

Rio de Mojácar or de Aguas only flows after heavy rains; at its
35 mouth, about 1½ miles northward of Punta del Cantal, a spit extends a short distance offshore.

Marina de las Torres, a village on the coast about three-quarters of a mile northward of the mouth of Rio de Mojácar, has a jetty for loading iron ore into barges. This jetty extends a short distance from
40 the coast and is connected with the mines by a railway.

Anchorage.—Anchorage can be obtained off Playa de Macenas in depths of from 5 to 14 fathoms (9^m1 to 25^m6).

Anchorage can be obtained, in a depth of 6½ fathoms (11^m9), northward of the jetty at Marina de las Torres, with Torre del Peñon in
45 line with the point at the mouth of Rio de Mojácar, bearing about 197°; southward of the jetty, the depths shoal considerably.

La Garrucha.—**Lights.**—**Buoys.**—Castillo de Garrucha, or de Jesús Nazarino, or de San Ramón, stands about three-quarters of a mile northward of the jetty at Marina de las Torres and is a coastguard
50 station.

A light is exhibited, at an elevation of 62 feet (18^m9), from a white tower, 33 feet (10^m1) in height, situated about a quarter of a cable north-north-westward of the castle.

La Garrucha is a town situated on the coast northward of the

Chart 774.

castle ; on its north-western side is Cerro del Calvario, on which there is a factory chimney. This town is fronted by a sandy beach, and at its northern end is a lead foundry ; there is another foundry close westward of the town. Lead and iron ores, marble, esparto grass and cereals are exported. 5

Muelle de Levante extends about 3 cables south-south-eastward from abreast the northern part of the town. In 1941, this mole was being extended.

A light is exhibited, at an elevation of 34 feet (10^m4), from a wooden post, 26 feet (7^m9) in height, situated on the head of Muelle de Levante. 10

A green can buoy is moored about 100 feet (30^m5) south-westward of the head of the visible part of Muelle de Levante.

In 1949, Muelle de Poniente was under construction, about 3½ cables southward of Muelle de Levante. 15

A red can buoy marks the head of Muelle de Poniente.

The entrance to the harbour is between the green and red buoys.

There is a flagstaff and vessels can communicate by means of the International Code of Signals.

Minor repairs can be executed. 20

Anchorage.—Anchorage, during offshore winds, can be obtained off the centre of the town of La Garrucha, in depths of 16 or 8 fathoms (29^m3 or 14^m6), sand, respectively, about 2½ and 2¼ cables offshore. Between 4 and 6½ cables offshore is a deep that runs parallel with the coast and has depths of from 25 fathoms (45^m7) to over 100 fathoms (182^m9), and caution must be exercised to avoid anchoring in it. 25

When a north-easterly or easterly wind prevails in the offing, but not of gale force, it will be northerly at the anchorage, and when the wind is south-westerly or westerly in the offing, it will be north-westerly at the anchorage, especially in moist weather. 30

Life-saving.—Life-saving appliances are maintained at La Garrucha. See page 15.

Coast.—From La Garrucha the sandy beach trends about 5 miles northward to the mouth of Rio Almanzora, and near the middle of this stretch of coast is the mouth of Rio de Antas (*Lat.* 37° 12' N., 35 *Long.* 1° 49' W.).

La Bolaga, between La Garrucha and the mouth of Rio de Antas, is a loading place for iron ore. It has a small jetty which is connected by aerial cable with the mines.

Rio de Antas only flows after heavy rains ; its mouth should not be approached too closely on account of silt. 40

Fondeadero de Palomares lies off the coast between the mouths of Rio de Antas and Rio Almanzora. Between these rivers are two foundries, one of which is closed and out of repair, and a coastguard hut.

Rio Almanzora, Guadalmanzor or de Cuevas is only a small stream in summer, but after heavy rains it rises considerably. 45

Torre de Villaricos stands close northward of the mouth of Rio Almanzor, about one cable inland, on a point which slopes down from the southern end of Sierra Almagrera, see page 87.

Villaricos, the seaport of Cuevas de Vera, a city about 5½ miles north-westward, is situated close northward of Torre de Villaricos. 50

From abreast Villaricos, the high, rugged coast trends about 4½ miles north-north-eastward to Punta de Sarria ; it is backed by the southern part of Sierra Almagrera. Puntal del Ruso, the highest peak of Sierra

Chart 774.

Almagrera, rises to an elevation of 1,204 feet (367^m0), about 2½ miles northward of Villaricos.

In this stretch of coast are several coves, of which the principal ones, 5 proceeding north-eastward, are :—

Cala del Hortelano, where there is a small jetty.

La Balsa, where fishing boats can obtain shelter in all weathers. The position of this cove can be identified by an ore cutting in the form of a well-marked *arrête* at its entrance. In this cove there is

10 a rock, which is almost always marked by breakers.

Cala de la Luz Electrica, where there is an electricity generating station with a high chimney at its western end.

Cala de las Borregas, where there is a lead foundry, is easy to identify by the whiteness and height of the building. At night it is usually 15 brilliantly illuminated. About half-way between this cove and Cala de la Luz Electrica is a coastguard hut.

Cala de las Picotas or de la Raja, which affords shelter to small craft from south-westerly and north-westerly winds. In it is a small mole ; it may be identified by an aerial cable which passes over Sierra

20 Almagrera.

Cala de la Mina del Oro, a shipping place for ore. It also has an aerial cableway, and may be identified from a distance by a warehouse at its head close northward of the cable terminus.

Cala de Cristal, about 2½ miles north-eastward of Villaricos, which 25 is available for fishing craft only. There is a coastguard hut here.

Cala de las Conchas, with three blast furnaces and a large building at its head.

Off-lying dangers.—Loza de Peyo, with a depth of 3½ fathoms (6^m9), lies about 6½ cables south-eastward of Punta de Sarriá (*Lat.* 30 37° 17' N., *Long.* 1° 42' W.).

Piedra de Calón, with a depth of 16 feet (4^m9), is situated about 6½ cables east-north-eastward of Punta de Sarriá.

Anchorage.—**Caution.**—Anchorage can be obtained, in depths of 7½ fathoms (13^m7), a little southward of the loading place at La Bolaga, 35 with the extremity of Punta del Peñon in line with the point at the mouth of Rio de Mojácar.

Owing to the silt of Rio Almanzora, the depths in the northern part of Fondeadero de Palomares have decreased considerably, and this anchorage should not be used without local knowledge.

40 Anchorage, during offshore winds only, can be obtained off Villaricos, in depths of from 8 to 11 fathoms (14^m6 to 20^m1), mud and good holding ground, about 3½ cables offshore. Although south-easterly and easterly winds blow directly onshore at this anchorage, they do not usually blow home, but easterly winds, which prevail in February and March, 45 are considered dangerous. South-westerly winds do not often blow home either, and those from southward are rare ; with good ground tackle vessels can nearly always ride out the bad weather at this anchorage. In the evening, there is usually a land wind or a calm ; it would, nevertheless, be prudent to put to sea should a change indicate 50 an easterly wind, which usually begins with a light breeze from south-south-eastward, gradually increases, and is accompanied at times by showers. Easterly winds sometimes shift to north-west, which is the prevailing and strongest wind, and impedes loading operations.

Temporary anchorage can be obtained, with offshore winds, off any

Charts 2717, 2158a.

Chart 774.

of the coves between Villaricos and Punta de Serriá, but local knowledge is essential.

A vessel anchoring off Cala de las Borregas should do so in depths of from $6\frac{1}{2}$ to $9\frac{1}{2}$ fathoms (12^m3 to 17^m8), neither more nor less, to avoid a rocky bottom. 5

Coast.—From Punta de Sarriá, the coast, which is backed by the northern part of Sierra Almagrera, trends about 4 miles northward and north-eastward to Punta de San Juan de los Terreros.

Pozo del Esparto is situated near a sandy beach at the mouth of a watercourse about $2\frac{1}{4}$ miles northward of Punta de Sarriá, and between them are several coves, but they afford no shelter. Near Pozo del Esparto is a disused factory with a coastguard hut close to it.

Castillo de San Juan de los Terreros is in ruins; it stands on a steep point of moderate elevation, which projects south-eastward from the coast. On the western side of the point is a cove that affords shelter to small craft, with local knowledge, from easterly winds, and on this side there are two ore-loading places westward of a coastguard hut. 15

Isla de los Terreros lies about 4 cables southward of Castillo de San Juan de los Terreros, and is 157 feet (47^m8) high. It is steep-to, and in the middle of the channel between it and the coast there is a depth of $6\frac{1}{2}$ fathoms (11^m9), sand and rock. During strong south-easterly winds the sea breaks right across this channel. 20

Isla Negra (*Lat.* $37^{\circ} 21' N.$, *Long.* $1^{\circ} 39' W.$), close northward of Castillo de San Juan de los Terreros and one cable offshore, is small, rugged and about 6 feet (1^m8) high. 25

Punta Parda lies about $1\frac{1}{2}$ miles north-eastward of Castillo de San Juan de los Terreros, and between them the coast, which is high and free from off-lying dangers, forms a bay, in the shores of which are several coves. Rambla de los Tarais, the largest of these coves, comprises the northern part of the bay, but it is only available for small craft, with local knowledge. There are some farm buildings and a coastguard hut at Rambla de los Tarais. 30

From Punta Parda, the coast trends about $2\frac{1}{4}$ miles north-eastward to Puerto de Aguilas; in it are a few coves and sandy beaches of little importance, the first and largest of the coves being Cala Redonda or Redona, about one-quarter of a mile north-eastward of Punta Parda. 35

Anchorage.—There is anchorage, in depths of 8 fathoms (14^m6), weed, about $3\frac{1}{2}$ cables offshore, abreast the disused foundry at Pozo del Esparto. 40

Anchorage can be obtained, by vessels with local knowledge, during north-easterly winds, in depths of about $5\frac{1}{2}$ fathoms (10^m1), sand and weed, off the ore-loading places westward of Isla de los Terreros, about $3\frac{1}{2}$ cables offshore. 45

Chart 2717, plan of Port Aguilas.

Puerto de Aguilas.—**Light.**—**Danger.**—This port is situated in a cove between Monte de las Aguilas and Monte de Aguilica, *see* below, and is protected by a mole, extending about 2 cables east-north-eastward from Punta Negra, the south-eastern extremity of Monte de las Aguilas. This harbour is available to vessels drawing up to 23 feet (7^m0). In 1949, considerable shoaling was reported in the harbour. 50

Monte de las Aguilas, *see* view on page 77, is a rocky peninsula, 279 feet (85^m0) high, and being conical in shape and of a reddish colour is easily identified. On its summit are the ruins of Castillo de San

Chart 2717, plan of Port Aguilas.

Juan, and on its western side is Puerto de Poniente, which latter has a sandy beach.

A light is exhibited, at an elevation of 46 feet (14^m0), from a light-5 grey building with a grey, octagonal tower, 26 feet (7^m9) in height, situated on Punta Negra.

A light is exhibited, at an elevation of 30 feet (9^m1), from a wooden mast, 16 feet (4^m9) in height, situated near the head of the mole.

A light is exhibited, at an elevation of 15 feet (4^m6), from a post at 10 the ore-loading berth.

Vessels moor in tiers to the mole or secure alongside the wharves. The holding ground is good, being sand with a heavy growth of weed. In 1939, the projecting part of the wharf was in ruins. There are two warping buoys.

15 Bajo Paral, with a depth of 2 feet (0^m6), lies about half a cable southward of Punta Negra lighthouse.

The town of Aguilas or San Juan de las Aguilas stands westward and north-westward of the harbour. For deratisation, *see* page 22.

Fishing nets are occasionally laid in the entrance to the harbour.

20 *See* page 27.

Anchorage.—Anchorage, sheltered from north-westerly winds, can be obtained, in depths of from 4½ to 7 fathoms (7^m8 to 12^m8), weed, about 2 cables 315° from Punta del Aguilucho, the western extremity of Monte de la Aguilica.

25 **Puerto del Hornillo.**—**Light.**—This harbour is entered between Monte de la Aguilica and El Fraile, about 4 cables eastward.

Monte de la Aguilica forms a small peninsula, connected with the coast by a narrow isthmus; its southern side is faced by rocky cliffs.

El Fraile (*Lat.* 37° 24' N., *Long.* 1° 33' W.) is a rocky island, of 30 moderate elevation, situated about 1½ cables southward of Punta del Cambrón, with which it is connected by a shoal flat.

A pier extends 538 feet (164^m0) eastward from Los Amarillos, in the western part of the harbour; it has depths of 28 feet (8^m5) alongside.

A light is exhibited, at an elevation of 46 feet (14^m0), from a black 35 iron post, 3 feet (0^m9) in height, situated on the pierhead.

Currents.—The currents in Puerto de Aguilas and Puerto de Hornillo set in the direction of the prevailing wind.

Coast.—Cala de la Barrilla, is entered a short distance north-eastward of Punta del Cambrón. On its shores stands a coastguard 40 hut.

Cala Bardina lies on the western side of Monte Cope, *see* below, about 2½ miles north-eastward of El Fraile.

Tunny nets, *see* page 27, are laid out, periodically, off Punta del Peñon de Santa Maria, *see* below, and in the approach to Cala Bardina.

45 **Anchorage.**—Cala Bardina affords good shelter from easterly winds, to vessels with local knowledge, in depths of 13 fathoms (23^m8), sand and weed, about one cable off its eastern shore, also, in depths of 7 fathoms (12^m8), about 2 cables off the beach.

Chart 2717, plan of Cope anchorage.

50 **Coast.**—Monte Cope, 823 feet (250^m8) high, is a reddish promontory, steep-to, and rocky on its south-eastern side. Its southern extremity is Punta del Peñon de Santa Maria, and its north-eastern one Punta del Cerro de la Crux. *See* view facing page 77.

Fondeadero de Cope is entered between Punta del Cerro de la Crux

Charts 774, 2717, 2158a.

Charts 2717, plan of Cope anchorage.

and Punta de la Cola about three-quarters of a mile northward ; it is free from dangers.

Torre de Cope stands on level ground near the coast about half a mile southward of Punta de la Cola, and is a coastguard station with several 5 buildings near it.

Anchorage.—Anchorage, sheltered from south-westerly and north-westerly winds, can be obtained, in depths of 7 or 8 fathoms (12^m8 or 14^m6), sand, northward of Punta del Cerro de la Cruz, and not less than half a mile from the tower. 10

Chart 774.

Golfo de Mazarrón.—This bight is entered between Monte Cope and Cabo Tifoso, about 19 miles east-north-eastward. The shores of this bay are moderately low, but are backed by high land. About 2 miles inland from the head of the bight stands the town of Mazarrón. 15 With the exception of the rock off Punta de Calnegre, *see* below, the shores of this bight are free from off-lying dangers and may be approached to a prudent distance. *See* view facing page 94.

For caution concerning submarines, *see* page 10.

Coast.—Danger.—Cala Blanca, about 3 miles north-north-east- 20 ward of Monte Cope, is only suited to small craft ; on the northern side of the cove is a coastguard hut.

Cala Ciscar and Cala Honda, at each of which is a coastguard hut, are, respectively, about 1½ and 2½ miles north-eastward of Cala Blanca, and the stretches of coast between them are moderately high. 25

Punta de Calnegre, about one mile east-north-eastward of Cala Honda, is situated between two beaches whence ore is shipped. Playa de Calnegre is the south-western and Playa de Parazuelos (*Lat.* 37° 30' N., *Long.* 1° 24' W.) the northern beach.

A detached rock, with a depth of 13 feet (4^m0), lies about 3½ cables 30 offshore, 4 cables southward of Punta de Calnegre.

Punta de Palomarico, in the neighbourhood of which are some mines, lies about 1½ miles north-eastward of Punta de Calnegre, and on its southern side are Cala de Percheles and Playa de Percheles. From Punta de Palomarico, the coast trends about 5 miles north-east- 35 ward and eastward to Cabezo del Castellar, and consists of a series of coves and beaches separated by small points.

Punta de las Cobaticas lies about one mile north-eastward of Punta de Palomarico, and close northward of it stands Cabezo de la Pelea, with Playa del Cabezo de la Pelea under it. 40

Punta del Sequero lies about 2 miles north-eastward of Punta de las Cobaticas. Isla Cueva de los Lobos is situated about half a mile eastward of Punta del Sequero.

Cabezo del Castellar is a small rounded promontory, close off which lies Mona del Cocedor, a sunken rock. About one mile westward of 45 Cabezo del Castellar are the ruins of a square tower near which are some farm buildings.

Isla de Adentro lies close inshore about one mile eastward of Cabezo del Castellar, with some above-water rocks between it and the beach. 50

Anchorage.—Anchorage can be obtained off Cala Blanca, in depths of about 8 fathoms (14^m6).

Anchorage can be obtained, during offshore winds, off Playa de Calnegre, in depths of 6 or 7 fathoms (11^m0 or 12^m8).

Charts 2717, 2158a.

Chart 774.

Anchorage can be obtained during offshore winds, off Playa de Parazuelos, in depths of 7 or 8 fathoms (12^m8 or 14^m6), sand.

Anchorage can be obtained off Cala de Percheles, in a depth of about 5 8 fathoms (14^m6).

Chart 2717, plan of Mazarrón, etc.

Ensenada de Mazarrón.—Light.—Dangers.—This bay is entered between Cabezo del Puerto, close eastward of Isla de Adentro, and Cabo de la Azohia or de la Subida, about 4 miles eastward. The 10 shores of the bay are mostly sandy, and the eastern part is the highest. At the eastern and western ends of the bay, respectively, are Puerto de Mazarrón and Fondeadero de la Azohia.

A light is exhibited, at an elevation of 203 feet (61^m9), from a white building with a grey lantern, 26 feet (7^m9) in height, situated on the 15 north-eastern extremity of Cabezo del Puerto.

Bajo de Fuera, with a depth of 8½ fathoms (16^m0), and Bajo de Dentro, with a depth of 9½ fathoms (16^m9), are two rocks situated, respectively, about 3½ cables east-south-eastward and 9½ cables north-eastward of Punta de los Aviones, the south-eastern extremity of 20 Cabezo del Puerto.

La Galerica consists of two isolated, above-water rocks, almost joined together, with foul ground around them, situated about 3½ cables northward of Cabezo del Puerto lighthouse and 1½ cables offshore.

The town of Mazarrón (*Lat.* 37° 34', *Long.* 1° 15' W.), in which 25 there is a coastguard station, exports considerable quantities of ore, esparto grass, &c. There are three wooden piers.

Torre Vieja or de Salinas, round and 36 feet (11^m0) in height, surmounts a low, whitish cliff about half a mile north-westward of Cabezo del Puerto lighthouse.

30 Cabezo del Mojón, about 1½ miles north-eastward of Cabezo del Puerto lighthouse, is fairly steep-to and is remarkable on account of its dark-grey colour.

Isla Plana lies close inshore about one mile eastward of Cabezo del Mojón. It is flat and from it above-water rocks extend about one 35 cable southward.

Bajo Ballesta, with a depth of 4½ fathoms (7^m8), rock, lies about 1½ cables south-south-westward of the southern extremity of Isla Plana.

Playa de la Calera extends about one mile east-south-eastward from 40 abreast Isla Plana to Punta de San Ginés. From it extend four wooden piers for loading iron ore.

Punta de San Ginés is foul and should be given a wide berth.

Torre de la Azohia is an octagonal building standing on Cabo de la Azohia; there is a village northward of it, and farther in the same 45 direction a coastguard hut.

Fishing nets are occasionally laid out in Ensenada de Mazarrón. See page 27.

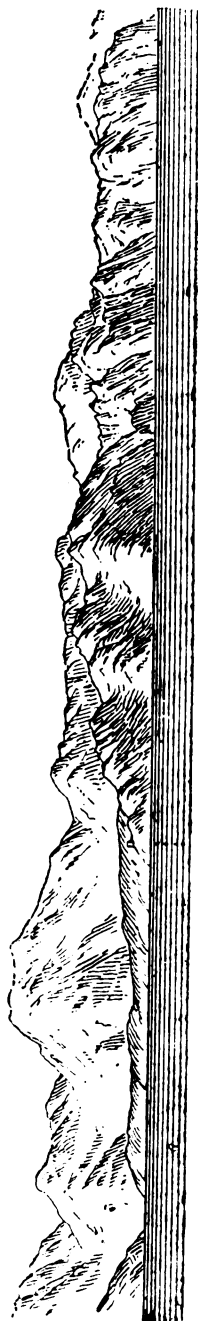
Anchorage.—Puerto de Mazarrón affords anchorage, sheltered from westerly winds, to vessels with local knowledge, in depths of 50 about 7 fathoms (12^m8), weed, between Cabezo del Puerto and La Galerica. Larger vessels anchor north-eastward of Cabezo del Puerto lighthouse.

Fondeadero de la Azohia affords good shelter from easterly winds, in depths of 7 or 8 fathoms (12^m8 or 14^m6), sand, from 2½ to 3½ cables



Cabezo del Puerto
lighthouse, bearing
353°, 18 miles.

Approach to Golfo de Mazarrón from southward.



Torre de la
Azohia, bearing
022°.

Approach to Fondeadero de la Azohia from south-south-westward.



Punta Seca.

La Hormiga
Grande light-
house, bearing
230°, 6½ cables.

Cabo de
Palos light-house.

Los Juncos.

Los Juncos from north-eastward.

(Originals dated 1893.)



*Cabo de Palos lighthouse,
bearing 233°,
one mile.*

El Junco Grande.

Cabo Palos from north-eastward.



*Sierra
Callosa*

*Isla Grosa,
bearing 345°, 5½ miles.*

El Farallón

Isla Grosa from south-eastward.



*Mesa de
Roldán.*

*Isla Grosa from eastward.
(Originals dated 1893.)*

Isla Grosa.

El Farallón.

Chart 2717, plan of Mazarrón, etc.

north-north-westward of Torre de la Azohia. In winter this anchorage is exposed to south-westerly winds. See view facing page 94.

Life-saving.—Life-saving appliances are maintained at Mazarrón.

See page 15.

5

Chart 774.

Measured distance.—A measured distance of 6075·6 feet (1,851^m4) for the use of submarines is situated off the shore of Ensenada de Mazarrón. The running course is 105° and 285°.

Coast.—**Light.**—Cabo Tiñoso, about 3 miles east-south-eastward 10 of Cabo de la Azohia, is high, precipitous, of a reddish colour, and shows up well from seaward. The coast between the capes is high and rugged.

A light is exhibited, at an elevation of 479 feet (146^m0), from a white tower and dwelling with a grey cupola, 33 feet (10^m1) in height, situated 15 on Cabo Tiñoso.

Cala or Rincón de la Salitrona is a cove, with a sandy beach, about 1½ miles north-westward of Cabo Tiñoso; it is protected by the high land of which the cape is the extremity.

A rock, with a depth of 3 feet (0^m9), lies about 1½ cables from the 20 beach at the head of a cove about 2 miles northward of Cabo Tiñoso; off the cove is Fondeadero de los Boletes, and on its shore stands a coastguard hut.

Currents.—Strong currents, usually east-going, are experienced off Cabo Tiñoso.

25

Abnormal magnetic variation.—An area of abnormal magnetic variation was reported, in 1949, to exist about 3 miles southward of Cabo Tiñoso.

Anchorage.—Cala Salitrona affords anchorage to small vessels with local knowledge.

30

Charts 774 and 1372.

Coast.—Cala de Portús, a bay westward of Punta del Moco, which latter is about 3½ miles north-eastward of Cabo Tiñoso, affords shelter only to small craft with local knowledge.

Cabezo de Roldán, 1,837 feet (559^m9) high, is a prominent summit 35 that rises fairly steeply from the coast about one mile eastward of Punta del Moco.

Isla de las Palomas is a rugged islet, southward of Cabezo de Roldán, that is separated from the coast by a deep channel, about 6½ cables wide.

40

La Terrosa, a rock connected with the coast by a spit of sand, lies about one mile south-eastward of Cabezo de Roldán.

Submarine exercise areas.—These are two areas in the neighbourhood of Cabo Tiñoso. Zone A is bounded by the meridian of Cabo Tiñoso, the coast, and the parallel of 37° 25' N. latitude. Zone B 45 is bounded by the coast and an imaginary line joining Cabo Tiñoso and La Terrosa.

Chart 1194.

CARTAGENA AND APPROACHES. — Dangers. — Light. —

Light-buoy.—**Beacons.**—Punta de la Podadera, about 1½ miles 50 east-north-eastward of La Terrosa (Chart 774), lies on the western side of the approach to Cartagena. Westward of this point are two coves, Algameca Grande and Algameca Chica, separated by Punta de la

Charts 2717, 2158a.

Chart 1194.

Veleta. These coves afford anchorage to small craft with local knowledge, only.

Punta de la Podadera (*Lat. 37° 35' N., Long. 0° 59' W.*) is bold, steep-to and of moderate elevation; on it stands a fort.

Punta de los Aguilones, on the southern side of the approach to Cartagena, lies about $1\frac{1}{2}$ miles south-eastward of *Punta de la Podadera*, and is comparatively steep-to.

Islote de Escombrera lies about $2\frac{1}{2}$ cables westward of *Punta de los Aguilones*, and is steep-to and hilly.

A light is exhibited, at an elevation of 213 feet (64^m9), from a yellow circular tower on a yellow rectangular dwelling, 26 feet (7^m9) in height, situated on the summit of *Islote de Escombrera*.

Bajo de Escombrera, with a depth of $5\frac{1}{2}$ fathoms (10^m1), lies about $1\frac{1}{2}$ cables westward of the western extremity of *Islote de Escombrera*. The eastern end of the Military hospital in the south-eastern part of the city of Cartagena, in line with *Punta de Santa Ana*, see below, bearing 001°, leads about 2 cables westward of this shoal.

Boca Chica, the channel between *Islote de Escombrera* and *Punta de los Aguilones*, has depths of from 7 to 20 fathoms (12^m8 to 36^m6).

Ensenada de Escombrera is entered between *Punta de los Aguilones* and *Punta del Gate*, about one mile north-north-westward. *El Hoyo*, at the head of the bay, south-eastward of *Punta de los Paraes*, is very shallow. On the shores of this bay are many buildings. A mooring buoy lies about $1\frac{1}{2}$ cables south-westward of *Punta de los Paraes*, and vessels secure their sterns to it while working cargo.

A breakwater for the protection of *Ensenada de Escombrera* is under construction, which will extend about $2\frac{1}{2}$ cables north-north-westward from a position about $1\frac{1}{2}$ cables northward of *Punta de los Aguilones*. In 1948, about $1\frac{1}{2}$ cables of this breakwater had been completed. The extremity of these works is marked by a light-buoy, painted black and exhibiting a *green flashing light every second*.

Punta del Gate and the shore in its vicinity are steep and cliffy, but should not be approached closely. Between this point and *Punta de los Paraes* is *Cabo Negrete*. *Islote del Gate* lies close inshore about one cable north-westward of *Punta del Gate*.

Las Losas are three rocky heads about one cable west-north-westward of *Islote del Gate*. On the outermost rock is a black masonry beacon.

Punta de Trinca Botijas is a high cliffy point, surmounted by two batteries, about $3\frac{1}{2}$ cables north-westward of *Punta del Gate*. *Bajo de Trinca Botijas*, about half a cable from its north-western side, is a small detached 2-fathom (3^m7) patch. This shoal lies on the southern side of the approach to *Cala Cortina*.

Punta de Santa Ana, the eastern entrance point of *Puerto de Cartagena*, lies about 3 cables north-north-westward of *Punta de Trinca Botijas*. It is a low salient point, and on it stands a battery. *Bajo de Santa Ana*, about half a cable north-westward of the point, is a rock, with a depth of 10 feet (3^m0), that is marked by a black iron beacon. The passage between the rock and the point is foul.

Puerto de Cartagena.—Lights.—This harbour is protected by breakwaters. On the summits of the hills surrounding the harbour, which are from 650 to 950 feet (198^m1 to 262^m6) high, stand *Castillo*

Charts 774, 1372, 2717, 2158a.

Chart 1194.

de Galeras and Castillo de la Atalaya, on its western side, and Castillo de San Julián on its eastern side.

Punta de Navidad, on which stands a dismantled fort, lies on the western side of the entrance about 3 cables north-eastward of Punta de la Podadero, and from it Dique de Navidad extends about three-quarters of a cable south-south-eastward. 5

A light (*Lat.* 37° 34' N., *Long.* 0° 59' W.) is exhibited, at an elevation of 49 feet (14^m9), from a white circular tower with a red cupola, 36 feet (11^m0) in height, situated on the head of Dique de Navidad. 10

Dique de la Curra extends about 4 cables westward from a position on the eastern side of the harbour about 4½ cables north-north-eastward of Punta de Santa Ana.

A light is exhibited, at an elevation of 46 feet (14^m0), from a white, circular tower, with a green cupola, 36 feet (11^m0) in height, situated on the head of Dique de la Curra. 15

Muelle de Alfonso XII fronts the city on the northern side of the harbour, and at its western end, northward of a spur on which stands the Yacht Club-house, is a small boat harbour. In 1945, work was in progress to extend the face of Muelle de Alfonso XII about 30 feet (9^m1) southward, and dredging was contemplated to obtain a least depth of 30 feet (9^m1) alongside. 20

The eastern side of the harbour, between the eastern end of Muelle de Alfonso XII, and the root of Dique de la Curra, consists of basins and wharves. In 1949 the depths alongside these wharves were reported to be from 16 to 25 feet (4^m9 to 7^m6). 25

On the western side of the harbour are Ensenada Espalmador Grande and Ensenada Espalmador Chico, separated by Punta del Viento (Aire). The former is used as a quarantine anchorage and in it are several mooring buoys. 30

In the north-western corner of the harbour is the entrance to the Naval basin.

Within 65 feet (19^m8) of the heads of Dique de Navidad and Dique de Curra, there are depths of less than 16 feet (4^m9), and at a distance of 165 feet (50^m3), of from 42 to 62 feet (12^m8 to 18^m9) off Dique de Navidad, and of 33 feet (10^m1) off Dique de Curra. Eastward of an imaginary line joining the head of Dique de Curra and the Yacht Club-house, there are depths of more than 26 feet (7^m9), decreasing eastward. 40

The area immediately northward of Dique de Curra, the deepest part of the harbour, is reserved for men-of-war, which moor there head and stern.

Life-saving.—Life-saving appliances are maintained at Cartagena. See page 15. 45

City. — Port facilities. — Communications. — Cartagena is a Naval port; it is, however, much used by merchant vessels. South-eastward of the city, on the eastern side of the harbour, is the suburb of Santa Lucia. A British Consular officer resides in Cartagena.

Supplies of all kinds can be procured. Water is laid on to some of the quays. Supplies of coal and fuel oil are uncertain. A stock of diesel oil is maintained for naval use. 50

Repairs can be executed in the Government dockyard, where there is a dry dock, a floating dock and some slips, see page 486. Some

Charts 774, 1372, 2717, 2158a.

Chart 1194.

repairs can be undertaken by private firms. Cranes, including a floating crane of 40-tons capacity, are available.

The quarantine station is at Punta de Navidad. For deratisation, *see* page 22.

There is steamer communication with other Spanish ports, with England, Islas Canarias, Oran and Melilla.

Signal station.—Storm signals.—There is a signal station in Castillo de Galeras, which is connected with the telegraph system. This building is a square tower, painted black and white in horizontal bands, situated on the southern bastion of the castle.

Storm signals are shown. *See* page 11.

Directions.—Pilotage.—Pilotage, *see* page 20, is compulsory. Pilots are stationed at Dique de Navidad, and board vessels, weather permitting, near the breakwater (*Lat.* 37° 34' N., *Long.* 0° 59' W.).

A vessel should experience no difficulty in entering the port; but one approaching from westward should not pass too close to Punta de la Podadera, for by so doing she will increase the sharpness of the turn which has to be made when passing Dique de Navidad. Approaching from eastward, she should pass not less than 2 cables southward of Islote de Escombrera, and should not alter course northward until the Military hospital is open westward of Punta de Santa Ana, bearing more than 001°.

Instructions for berthing will be given by the Captain of the Port.

Charts 774 and 1372.

COAST.—From Punta de los Aguilones, the coast trends about 2½ miles eastward to Cabo del Agua, and is high, bold, and steep-to.

Cabo del Agua is high and rugged, and terminates in three peaks. Strong easterly winds cause heavy squalls off the cape, which should then be approached with caution.

Cala del Gorguel is a cove, with a sandy beach at its head, about 2 miles east-north-eastward of Cabo del Agua, and between them the coast is free from off-lying dangers, with the exception of La Manceba, a rocky islet close off the western entrance point of the cove.

From the eastern entrance point of Cala de Gorguel, the coast trends about one mile east-north-eastward to Punta de la Galera.

Chart 2717, plan of Porman bay.

Puerto de Porman.—Lights.—Beacon.—This cove is entered between Punta de la Galera and Punta de la Chapa, about 6½ cables east-south-eastward. At its head are sandy beaches, named Playa de San Bruno and Playa de la Rambla, but the points on either side of the entrance, especially the eastern one, are high and rugged. On the eastern side within the entrance, are Puntas de la Cruz, del Barco, de Cuevo Negra, de la Olleta and de la Olleta.

A light is exhibited, at an elevation of 161 feet (49^m1), from a white tower and dwelling, 26 feet (7^m9) in height, situated on the summit of a hill above Punta de la Chapa.

Bajo de Porman, about one cable north-westward of Punta del Barco, has a depth of 11 feet (3^m4). The sea breaks over this rock with onshore winds. It is marked by an iron beacon.

The town of Porman lies on the northern and western sides of the cove, and is a suburb of La Union, a city about 1½ miles north-westward.

Charts 2717, 2158a.

Chart 2717, plan of Porman bay.

There are a number of small piers in the cove, especially in its north-western corner. Various ores are exported.

A light is exhibited, at an elevation of 15 feet (4^m6), from the head of the mole on the western side of Puerto de Porman. 5

Anchorage.—Puerto de Porman affords anchorage in depths of from 6 to 10 fathoms (11^m0 to 18^m3), sand; large vessels usually moor, heading seaward, with the anchors north-north-westward and south-south-eastward of each other, and the stern secured to the shore or to a mooring-buoy, of which latter there are four. The anchorage is sheltered from south-westerly winds, and southerly and south-easterly ones seldom blow home, though southerly ones send in a considerable swell. Small craft can obtain good shelter from easterly winds northward of Punta de la Olleta. 10

Charts 774 and 1372.

Coast.—From Punta de la Chapa, the coast trends about one mile eastward to Cabo Negrete (*Lat.* 37° 34' N., *Long.* 0° 49' W.). 15

Cabo Negrete is high, rugged, and dark brown in colour; between 4½ and 3 miles north-westward of it, Cerro Santi-Espiritus (Spiritus) attains an elevation of 1,447 feet (441^m0). 20

In 1935, depths of 6½ and 8 fathoms (11^m9 and 14^m6) were reported about 4 miles eastward and 1½ miles east-south-eastward, respectively, of Cabo Negrete.

From Cabo Negrete, the coast trends about 4½ miles east-north-eastward to Cala Blanca, and along it are several short beaches. 25

Los Juncos are two conical hills; El Junco Grande, 1,102 feet (335^m9) high, lies about 2½ miles east-north-eastward of Cabo Negrete; El Junco Chico is 944 feet (287^m7) high. These hills form good marks and can be identified from north-eastward or south-westward. *See* view facing page 94. 30

A coastguard hut stands on the shore of Cala Blanca, and from the eastern entrance point of this cove the coast trends about 2½ miles north-eastward to Cabo de Palos, and decreases in elevation. This stretch of coast is much indented and is foul.

Punta Seca or de la Espada lies close north-eastward of Cala Blanca, 35 and about 4 cables farther north-eastward, Monte Escucha surmounts a point, close southward and northward of which lie, respectively, Caleta Cocón del Lobo and Cala Reona or Redona.

Islotes del Cargador lie, on the southern side of the approach to Cala del Cargador, about half a mile north-eastward of Monte Escucha, 40 and about one cable south-south-eastward of the outermost islet is Bajo del Cargador, with a depth of 9 feet (2^m7), rock.

There are several groups of above-water rocks within 1½ cables of the coast between Islotes del Cargador and Cabo de Palos.

Fishing nets are periodically laid out in the vicinity of the approaches 45 to Puerto de Porman and Cabo de Palos. *See* page 27.

Cabo de Palos. — Light. — Radio. — Pilots. — Life-saving. — This cape is the extremity of a small peninsula with a narrow isthmus on which stands the settlement of La Barra. It is fringed with rocky islets and is much indented. 50

A light (*Lat.* 37° 38' N., *Long.* 0° 41' W.) is exhibited, at an elevation of 262 feet (79^m9), from a dark grey tower on a dwelling, 164 feet (50^m0) in height, situated on Cabo de Palos. *See* view facing page 95. For Radio communication, *see* page 22. Pilots can be obtained here.

Charts 2717, 1766, 2158a.

Charts 774 and 1372.

Life-saving appliances are maintained at Cabo de Palos ; *see* page 15.

A vessel rounding the cape should not approach within 2 cables of the coast or of any of the above-water rocks in the neighbourhood.

Off-lying islets and dangers.—Light.—From Cabo de Palos, Las Hormigas, a chain of islets and rocky shoals, extend about 3 miles north-eastward, with deep channels between them. *See* view facing page 95.

- 10 Bajos de los Pajares, with depths of from 7 feet to 3 fathoms (2^m1 to 5^m5), lie $2\frac{1}{2}$ cables east-south-eastward, and Bajo de la Testa, with a depth of $4\frac{1}{2}$ fathoms (8^m7), lies $2\frac{1}{2}$ cables north-eastward, of Cabo de Palos lighthouse (*Lat.* $37^\circ 38' N.$, *Long.* $0^\circ 41' W.$).

- Bajos del Piles, with depths of $4\frac{1}{2}$ fathoms (7^m8), rock, lie about 15 three-quarters of a mile north-eastward of the lighthouse, with a detached 5-fathom (9^m1) rocky patch about $1\frac{1}{2}$ cables north-eastward of them. The passage between Bajo de la Testa and Bajos del Piles is about 3 cables wide, with depths of from $8\frac{1}{2}$ to 15 fathoms (15^m5 to 27^m4).

- 20 Bajo de Dentro, with a depth of $1\frac{1}{2}$ fathoms (2^m7), rock, lies about 13 cables north-eastward of the lighthouse, and between it and the patch north-eastward of Bajo del Piles there are depths of from 19 to 25 fathoms (34^m7 to 45^m7).

- El Hormigón is a rocky islet, about 30 feet (9^m1) high, lying about 25 2 miles north-eastward of the lighthouse on Cabo de Palos, with depths of from 18 to 30 fathoms (32^m9 to 54^m9) between it and Bajo de Dentro.

La Losa, two above-water rocks, almost joined together, lie about one-quarter of a cable north-eastward of El Hormigón.

- 30 La Hormiga, the largest of the chain, is 43 feet (13^m1) high, and is situated 2 cables north-north-eastward of La Losa.

A light is exhibited, at an elevation of 79 feet (24^m1), from a grey tower and dwelling, 38 feet (11^m6) in height, situated near the southwestern extremity of La Hormiga.

- 35 Bajo del Mosquito, with a depth of $1\frac{1}{2}$ fathoms (2^m7), rock, lies about three-quarters of a cable south-south-eastward of the light on La Hormiga, and, with this exception, there are depths of from 9 to 32 fathoms (16^m5 to 58^m5) between La Losa and the island.

- Bajo de Fuera, the outermost danger of Las Hormigas, has a depth 40 of 2 fathoms (3^m7), rock, and lies about $6\frac{1}{2}$ cables north-eastward of La Hormiga, with depths of from 18 to 30 fathoms (32^m9 to 54^m9) between.

- Although the channels between Las Hormigas are used to a considerable extent, they are not recommended for vessels without local 45 knowledge.

- Coast.—Lights.—Caution.**—From the northern side of the isthmus of Cabo de Palos peninsula, the coast trends about 13 miles north-north-westward to the coastguard hut at Mojón. This stretch of coast consists of a low sandy barrier from half a cable to half a mile 50 wide, which separates Mar Menor from the sea.

Mar Menor is a large salt-water lagoon in the southern part of which are several islets. On the western shore of the lagoon are some villages, which are visible from seaward ; the largest is San Javier, about 2 miles from the northern end of the lagoon. The only natural

Charts 2717, 1766, 2158a.

Charts 774 and 1372.

connection with the sea is a shallow break in the barrier, much obstructed by banks and shoals, near Torre de la Encañizada about 2 miles eastward of San Javier moleheads, *see* page 102. A small harbour for the use of Spanish Naval aircraft is situated at San Javier 5 and is protected by two moles.

A light (*Lat.* 37° 48' N., *Long.* 0° 48' W.) is exhibited, at an elevation of 11 feet (3^m4), from a conical building with a castellated top, painted yellow and black in stripes, situated on the head of each of the two moles at San Javier. 10

Punta de Calnegre, a rocky point partly covered with sand, lies about 2½ miles north-westward of Cabo de Palos and about 3 miles farther northward is El Pedrucho, another, but smaller, rocky outcrop; on each of these points there is a coastguard hut. The coast for about one mile northward and southward of Punta de Calnegre is foul for 15 about one cable offshore.

Torpedo practice is occasionally carried out between Cabo de Palos, Isla Grosa and El Estacio, *see* below. The range is marked by beacons and buoys. When practice is in progress, a red flag is displayed at a flagstaff on the summit of Isla Grosa, and vessels should 20 then keep eastward of an imaginary line joining Cabo de Palos and the island.

Anchorage.—Anchorage, sheltered from southerly and westerly winds, can be obtained in the bay between Cabo de Palos and the southern end of the foul ground southward of Punta de Calnegre, in 25 depths of about 7 fathoms (12^m8), good holding ground; but as it is exposed to north-easterly and south-easterly winds, it should only be used by small vessels with local knowledge.

Chart 1458, plan of Estacio, etc.

Fondeadero de la Isla Grosa.—**Danger.**—Isla Grosa, 318 feet 30 (96^m9) high, lies nearly 1½ miles offshore, about 5½ miles northward of Cabo de Palos; it is steep-sided, flat-topped, and may be approached to a distance of about half a cable, *see* views facing pages 95 and 102. La Boca del León is the southern extremity of the island, and close north-eastward of it is a ravine, named El Frontal. Cala de las 35 Galerotas is a cove in the north-eastern part of the island.

El Farallón, about 4 cables eastward of the north-eastern extremity of the island, is 72 feet (21^m9) high, and has a sharp-pointed summit; it should not be approached within half a cable.

La Laja is a small rocky patch, with a depth of 3 feet (0^m9), about 40 3½ cables north-eastward of El Farallón. El Farallón in line with the middle of Isla Grosa, bearing about 245°, leads about 1½ cables southward of this rocky patch.

Anchorage.—Fondeadero de la Isla Grosa affords anchorage, sheltered from easterly winds, in the positions indicated on the chart, 45 in a depth of about 4½ fathoms (8^m2), weed. A vessel approaching this anchorage from north-eastward should steer with the coastguard hut at El Pedrucho in line with a house on Isla Mayor, in the southern part of Mar Menor, bearing 227°, passing about midway between the shoal bank extending from the north-western side of Isla Grosa and the 50 extremity of the spit extending south-eastward from Los Escolletes, *see* page 102.

Fondeadero del Estacio.—**Light.**—This bay is formed by a small peninsula which projects eastward from the coast to a position about

Charts 2717, 1766, 2158a.

Chart 1458, plan of Estacio, etc.

1½ miles north-north-westward of the north-western extremity of Isla Grosa (Lat. 37° 45' N., Long. 0° 43' W.).

A light is exhibited, at an elevation of 69 feet (21^m0), from a building surmounted by a yellow tower, 49 feet (14^m9) in height, on the low, rocky, south-eastern extremity of the above-mentioned peninsula. Near the lighthouse are a coastguard hut and other buildings.

Los Escolletes are two low islets from ¾ to 4 cables south-eastward of the lighthouse. They lie on a spit, with depths of less than 3 fathoms (5^m5), that extends from the peninsula to a position about 4 cables south-eastward of the islets.

Anchorage.—Fondeadero del Estacio affords anchorage to vessels of shallow draught, in the positions indicated on the chart, in depths of from 2½ to 3 fathoms (4^m6 to 5^m5), weed. This anchorage affords good shelter, for there is so thick a growth of weed on the shoal spit eastward of it that the sea is broken and only the wind is felt.

Chart 1372.

Coast.—Caution.—Lights.—Between Punta del Pudrimel, the northern extremity of the peninsula on the northern side of Fondeadero del Estacio, see plan on chart 1458, and the coastguard hut at Mojón, about 6 miles north-westward, the coast is fringed by a shoal bank, which, in places, extends as much as one-quarter of a mile offshore.

Cerro del Cabezo Gordo is a prominent, steep-sided, isolated hill, 1,040 feet (317^m0) high, situated about ¾ miles westward of San Javier, see view facing this page. When seen from north-eastward it has some resemblance to Isla Grosa, and caution must be exercised, especially in misty weather, to avoid mistaking the hill for the island.

Torre de la Encañizada is a round tower, with a two-storied building near it, situated about 2½ miles north-north-westward of Punta del Pudrimel; it stands on one of the banks obstructing the natural entrance of Mar Menor. The channels round and between these banks are very shallow, and can only be used by light-draught vessels with local knowledge. Córcolaz coastguard station is another two-storied building about one mile south-eastward of that near Torre de la Encañizada.

Fondeadero de San Pedro del Pinatar, about 2 miles northward of Torre de la Encañizada, is an open roadstead used by small local vessels; the holding ground is bad.

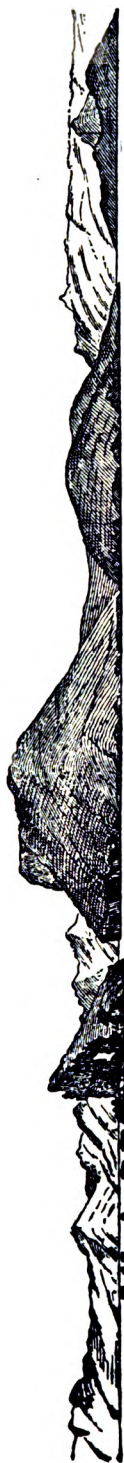
The coastguard hut at Mojón lies about 1½ miles northward of the village of San Pedro del Pinatar, and about one mile southward of the hut are the ruins of a tower.

Leading lights are exhibited, the front light from a small, triangular, wooden tower, 20 feet (6^m1) in height, situated on the beach at Mojón; and the rear light from a small triangular, wooden tower, 30 feet (9^m1) in height, situated about 200 feet (61^m0) westward of the front light-tower. These lights in line, bearing 271°, lead to Fondeadero de San Pedro del Pinatar.

Torre de la Horadada is a round tower, with a coastguard hut near it, about 5 miles northward of Torre de la Encañizada.

Cabo Roig is a conspicuous reddish headland on which stands a tower with a coastguard hut close north-eastward of it. This cape lies about 3 miles north-north-eastward of Torre de la Horadada, and between them the coast is moderately high and has several coves in it; but they are only available to small craft with local knowledge.

Charts 2717, 1766, 2158a.



El Farallón.

*Isla Grosa, bearing
228°, one mile.*

Isla Grosa from north-eastward.



*Summit, bearing
291°, 11 miles.
Estacio
lighthouse.*

Cerro del Cabezo Gordo from east-south-eastward.



*Summit, bearing
331°, 30 miles.*

Sierra de Callosa from south-south-eastward.

(Originals dated 1893.)



Sierra de Isjona.
Cabo de Santa
Pola.

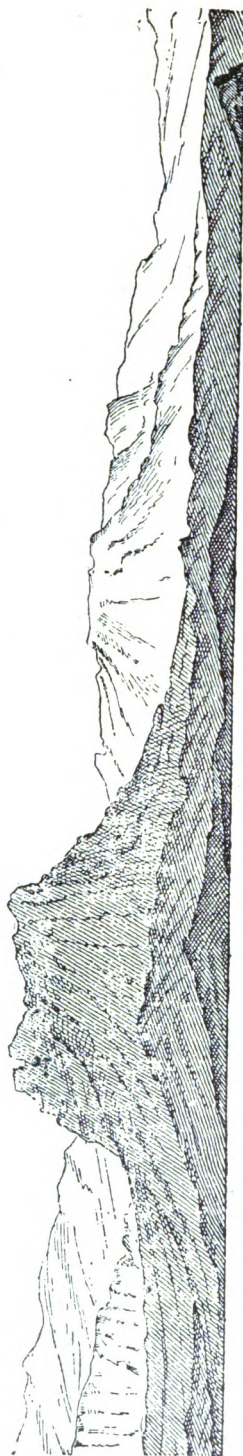
Castillo de
Santa Barbara.

Cerro de San
Julian.

El Cabreo,
distant 30
miles.

Isla de Tabarca
lighthouse, bearing
015°, 8 miles.

Approach to Alicante from southward.

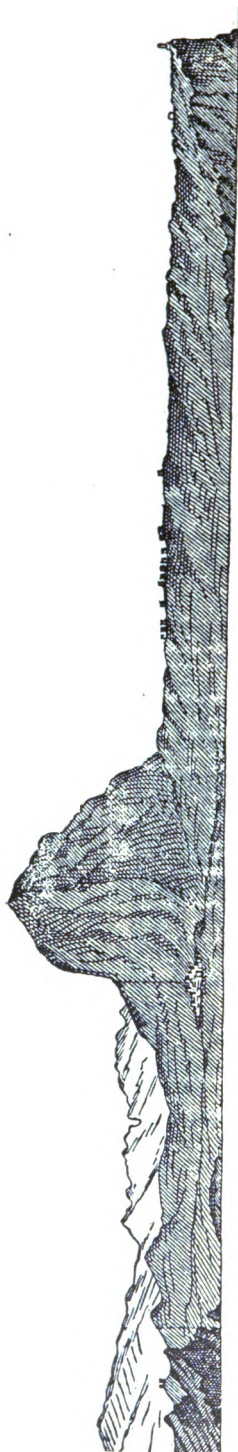


Cuchillada de
Roldán, bearing
347°, 12½ miles.

Puig Campana.

Puig Campana from southward.

Isole de
Benidorme.



Cabo de
San Martin.

Jávea. Monte Mongo,
bearing 294°.

Molinos.

Cabo de San Antonio from south-eastward.

Cabo de San
Antonio lighthouse,
bearing 309°, 5 miles.

(Originals dated 1893.)

Chart 1372.

Punta Prima, or Delgada, is about 2 miles northward of Cabo Roig, and in the moderately high, rocky coast between them are several coves. From Punta Prima, the coast trends about $2\frac{1}{2}$ miles north-north-eastward to Punta de la Cornuda.

5

Chart 1458, plan of P^{to} de Torrevieja.

Puerto de Torrevieja.—Lights.—This harbour is protected from easterly winds by Dique de Levante, which extends about 3 cables southward and thence about 4 cables south-westward from the low, rocky Punta de la Cornuda. Dique de Poniente is under construction and, in 1949, extended about $1\frac{3}{4}$ cables south-eastward from the western shore of the harbour. Vessels should give these extension works a prudent berth.

10

A light (*Lat.* $37^{\circ} 58' N.$, *Long.* $0^{\circ} 41' W.$) is exhibited, at an elevation of 48 feet (14^m6), from a dark-grey, iron, framework pylon surmounting a hut, 33 feet (10^m1) in height, situated near the head of Dique de Levante.

A light is exhibited from the completed part of Dique de Poniente. This light is moved as the work progresses.

There are Government salt works in Torrevieja.

20

For deratisation, *see* page 22. Pilots, *see* page 20, are available.

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at Torrevieja. *See* page 15.

Anchorage.—Anchorage can be obtained under the shelter of Dique de Levante, in depths not exceeding 6 fathoms (11^m0).
Chart 1372.

25

Coast.—From Punta de la Cornuda, the coast trends about 2 miles north-eastward to Cabo Cervera, and consists of some rocky points, which separate coves only available for small craft with local knowledge.

Cabo Cervera is low, and is surmounted by the ruins of a tower; 30 from it the coast, which is backed by hills, trends about 9 miles northward to Punta del Pinet.

Torre de la Mata stands in a village, in which there is a coastguard station, close to the coast about $1\frac{1}{2}$ miles northward of Cabo Cervera; westward of the village there are extensive salt-pans.

35

Playa de la Mata is a beach of white sand, backed by vegetation, extending northward from the village.

Guardamar is a town near the beach, about 5 miles northward of Cabo Cervera, and in it is a coastguard station. It stands at the foot of a hill on the summit of which are the ruins of a castle.

40

Rio Segura flows into the sea about $1\frac{1}{2}$ miles northward of Guardamar and at its mouth is a shallow, shifting bar. Sand spits extend south-south-eastward and north-eastward on either side of the mouth of this river, for distances, respectively, of about 2 and 3 cables, and depths of less than 3 fathoms (5^m5) extend about 6 cables offshore.

45

Sierra de Callosa attains an elevation of 1,883 feet (573^m9) about $11\frac{1}{2}$ miles west-north-westward of Guardamar; it is rugged, dark in colour, and can easily be identified, *see* view facing page 102.

Torre del Pinet stands on the coast about $2\frac{1}{2}$ miles northward of the mouth of Rio Segura. Near this tower stands a coastguard hut.

50

Bahia de Santa Pola.—Lights.—This bay is entered between Punta del Pinet and Cabo de Santa Pola, about 6 miles north-eastward. Its shores are fringed by a bank, which, with depths of less than 5 fathoms (9^m1), sand and weed, extends as much as $1\frac{1}{2}$ miles offshore in places.

55

Charts 2717, 1766, 2158a.

Chart 1372.

Torre del Tamarit, or de la Albufera, is situated about 2 miles northward of Torre del Pinet, within the shallow entrance of a lagoon, named Albufera de Elche. On the shore of the bay and about mid-
5 way between the two towers is a wooden pier; an iron pier extends from the shore about one mile eastward of Torre del Tamarit.

Fondeadero del Tamarit lies on the western side of the bay, off the above-mentioned piers (*Lat.* 38° 10' N., *Long.* 0° 36' W.).

The town of Santa Pola stands on the northern shore of the bay
10 about 3 miles eastward of Torre del Tamarit, and its principal export is salt. Castillo de Santa Pola is a square building, within the walls surrounding which stands the old town; the modern town is built round and northward of it.

A mole extends about 1½ cables southward and thence 2¾ cables
15 west-south-westward from the shore abreast Santa Pola. The custom house, a rectangular, yellowish, two-storied building, with a reddish vertical stripe in the middle, stands on the mole.

A light is exhibited, at an elevation of 28 feet (8^m5), from an iron pylon situated on the head of the mole.

20 In 1946, work was in progress south-westward of the root of the mole. These works are marked by small buoys, which are moved as the work progresses.

A light is exhibited from the head of the mole, which is about one cable long, about one mile eastward of Santa Pola.

25 Torre de la Escaleta stands on the cliffs on the southern side of Cabo de Pola.

Anchoragees.—Bahia de Santa Pola affords shelter from offshore winds, and from those from north-eastward and east-south-eastward; though open from east-south-east to south-south-west, winds from
30 these directions do not raise much sea.

Fondeadero del Tamarit affords secure anchorage in depths of from 2¾ to 3½ fathoms (5^m0 to 5^m9), weed; but local knowledge is necessary for the bottom is uneven.

Fondeadero de Santa Pola affords anchorage to vessels with local
35 knowledge, in depths of from 3½ to 4½ fathoms (5^m9 to 7^m8), weed, about 3 cables southward of the light-structure on the molehead at Santa Pola. Larger vessels can obtain anchorage, in depths of 7 or 8 fathoms (12^m8 or 14^m6) farther offshore on the same bearing, and also further eastward, but in the latter position, caution must be exer-
40 cised to avoid some detached 4¾-fathom (8^m7) patches about 2 miles south-eastward of the above-mentioned light-structure.

Off-lying island and dangers.—**Light.**—**Light-buoy.**—Isla de Tabarca is situated with its western extremity about 2½ miles south-eastward of Torre de la Escaleta. It is low and level, and at its
45 western end are the fishing village of Tabarca and Castillo de San Pablo, the walls of which latter attain an elevation of about 33 feet (10^m1); but both the village and the castle are in a dilapidated condition. Both the northern and southern sides of the island are fringed with rocks; many of these are above-water, and there are depths
50 about one cable seaward of them of from 2¾ to 7 fathoms (5^m0 to 12^m8). La Galera, the largest of these rocks, lies about half a cable off the middle of the southern side of the island, and eastward of it tunny nets, *see* page 27, are laid out.

A light is exhibited, at an elevation of 92 feet (28^m0), from a yellow,

Charts 2717, 1766, 2158a.

Chart 1372.

square tower surmounting a white building, 36 feet (11^m0) in height, situated about 3 cables westward of Punta Falcon, the low eastern extremity of Isla de Tabarca (*Lat. 38° 10' N., Long. 0° 28' W.*).

Farallon de la Nao is a low islet about 3 cables east-south-eastward of Punta Falcon; the passage between is obstructed by sunken rocks. A reef extends about one-quarter of a mile eastward from the islet.

Bajo de la Nao, with a depth of 2 fathoms (3^m7), rock, lies about 8 cables east-south-eastward of Farallon de la Nao.

A light-and-whistle-buoy, painted black and exhibiting a *green 10 flashing* light, about *every half second*, is moored eastward of Bajo de la Nao, about one mile east-south-eastward of Farallon de la Nao. Vessels should not attempt to pass between this light-buoy and Isla de Tabarca.

Bajo del Oeste, with a depth of 2½ fathoms (5^m0), lies about half a mile west-north-westward of the western extremity of Isla de Tabarca. It lies on a bank, which, with depths of less than 5 fathoms (9^m1), extends about 9 cables north-westward from the island.

Freu de Tabarca is the channel between Cabo de Santa Pola and Isla de Tabarca. On the south-eastern side of this channel is a shoal bank on which lies Bajo del Oeste, and on its north-western side a bank, with depths of less than 5 fathoms (9^m1), extends as much as one mile offshore. A detached 2½-fathom (5^m0) rocky patch lies about 8½ cables south-eastward of Torre de la Escaleta. This channel should not be attempted by vessels of deep draught without local knowledge, and 25 vessels of light draught should use great care.

ALICANTE AND APPROACHES.—Dangers.—Lights.—

Bahia de Alicante is entered between Cabo de Santa Pola and Cabo de las Huertas, about 10 miles north-north-eastward, and its shores may be approached in safety to a distance of about one mile. 30

Bahia de Alicante is easily identified by the mountains and hills in its vicinity. At the head of the bay, and about 4 miles inland, Sierra de Font Calent rises to an elevation of 2,375 feet (723^m9), and Sierra de Jijona, about 11 miles north-north-eastward of these mountains, is 4,045 feet (1,232^m9) high. *See view facing page 103.* 35 Eastward of Sierra de Font Calent, Cerro del Tozal, which is crowned by the ruins of Castillo de San Fernando, rises close north-westward of the city of Alicante, and near the shore within one mile north-eastward of the city are Cerros del Castillo, del Molinet, and de San Julián. Cerro del Castillo is a conspicuous, conical, limestone hill, 587 feet 40 (178^m9) high, on the summit of which is Castillo de Santa Barbara, *see chart 469*, and Cerro de San Julián attains an elevation of 594 feet (181^m0). On nearer approach, Cabo de Santa Pola, Cabo de las Huertas and Isla de Tabarca are easily identified.

Cabo de Santa Pola is moderately high and of a reddish colour; 45 from northward or southward it first appears as flat projection ending in a steep slope; on nearer approach, the level ground at the foot of the slope comes into view.

A light (*Lat. 38° 12' N., Long. 0° 31' W.*) is exhibited, at an elevation of 498 feet (151^m8), from a metal structure on a white, square tower, 50 49 feet (14^m9) in height, situated on the crest of the slope at Cabo de Santa Pola.

Restinga de la Renegada extends about 1½ cables offshore near a

Charts 2717, 1766, 2158a.

Chart 1372.

coastguard hut at Cabo de Santa Pola: Cabezo Destacado is a detached rock, with a depth of $3\frac{1}{2}$ fathoms (5^m9), about half a mile south-eastward of the coastguard hut.

- 5 Playa del Saladar is an extensive beach, northward of Cabo de Santa Pola, off which the bottom is rocky. Casa del Pájaro is a coastguard station about 4 miles northward of Cabo de Santa Pola; there are other coastguard huts on the shores of the bay.

Ensenada de la Albufereta is a cove on the northern side of Bahía de Alicante, westward of Cabo de las Huertas. There is a tunny fishery, see page 27, off the cove.

Cabo de las Huertas is low, but about half a cable within it the land rises to a moderate elevation and is of a whitish colour. A reef, with depths of from $1\frac{1}{2}$ to $3\frac{1}{2}$ fathoms (2^m7 to 5^m9), lies about 2 cables eastward of the cape.

A light is exhibited, at an elevation of 121 feet (36^m9), from a white circular tower, 26 feet (7^m9) in height, situated on Cabo de las Huertas. Near this lighthouse stands a coastguard hut.

Anchorage.—Small vessels, with local knowledge, can obtain anchorage in Ensenada de la Albufereta.

Chart 469.

Puerto de Alicante. — Lights. — Light-buoy. — This port consists of an outer and an inner harbour. On its eastern side a breakwater extends about 4 cables southward from the coast near Cerro del Castillo, and thence about 6 cables south-westward. Near the middle of the first part of this breakwater, a mole extends about $1\frac{1}{2}$ cables south-westward, separating the outer from the inner harbour. The inner harbour is enclosed by another breakwater, extending about $1\frac{1}{2}$ cables south-eastward from the coast, and thence about $1\frac{1}{2}$ cables east-north-eastward towards the head of the mole separating the two harbours.

A light is exhibited, at an elevation of 46 feet (14^m0), from a grey, iron structure, 30 feet (9^m1) in height, situated on the head of the eastern breakwater (*Lat.* $38^\circ 20' N.$, *Long.* $0^\circ 29' W.$).

- 35 Two lights are exhibited, each at an elevation of 23 feet (7^m0), from an iron column, 13 feet (4^m0) in height, situated one on either side of the entrance to the inner harbour.

A light-buoy, painted red and exhibiting a *red flashing* light every three seconds, is moored about 2 cables north-westward of the head of the mole separating the two harbours and marks the works in progress in the inner harbour, see below.

In the outer harbour, there are depths of from 23 to 37 feet (7^m0 to 11^m3) alongside the outer part of the eastern breakwater and of 23 feet (7^m0) alongside its inner part. There are depths of from 13 to 16 feet (4^m0 to 4^m9) alongside the south-eastern side of the mole separating the two harbours.

In the inner harbour, there are depths of from 13 to 21 feet (4^m0 to 6^m4) alongside the berths on either side of the entrance, but the depths shoal considerably towards the roots of the moles. Alongside the quays on the northern side of the harbour, there are depths of from 4 to 6 feet (1^m2 to 1^m8). The entrance to the inner harbour is 275 feet (83^m8) with depths of 24 feet (7^m3).

In 1948, works were in progress for constructing a fishing port on the inner side of the western breakwater.

Charts 1187, 2717, 1766, 2158a.

Chart 469.

There is a mooring buoy in the inner harbour.

Pilotage.—Pilotage, *see* page 20, is compulsory. The pilot station is situated at the south-eastern corner of the outer harbour. The pilot boats are painted white, with a black P on each side. By day, 5 they display a blue flag with a white P.

Storm signals.—A blue flag is displayed above a black ball, by day, and a red light is exhibited above a white light, at night, from the flagstaff at the pilot station, when a gale is expected.

Anchorage.—Anchorage off Puerto de Alicante can be obtained by 10 large vessels, weather permitting, not less than one cable eastward of the outer part of the eastern breakwater, in depths of 6 fathoms (11^m0) or more. Small vessels can anchor off the western breakwater, but must not obstruct the fairway leading to the berths or to the entrance of the inner harbour. The holding ground in both cases is good. 15

In winter, with strong north-westerly winds, vessels often drag their anchors, if too far out.

Rada de Alicante is most exposed to east-south-easterly winds.

Port facilities.—All berths are connected with the railway system. Supplies of all kinds are plentiful. Water is laid on to the wharves or 20 can be supplied in a tank-vessel. Stocks of coal and fuel oil are maintained. Repairs can be executed. Cranes capable of lifting up to 30 tons are available. There is a motor salvage vessel, and the services of a diver can be secured.

There is a hospital. For deratisation, *see* page 22. 25

City.—Communications.—The ancient city of Alicante has outgrown its walls and is surrounded by suburbs. From it wine, petroleum products, dried and fresh fruits, esparto grass, tiles, bricks, &c., are exported.

Steamer communication is maintained with *Islas Baleares* and 30 Spanish ports, with the Americas, *Islas Canarias* and northern Africa. Coasting steamers call regularly.

There is air communication with France and northern Africa.

Chart 1372.

COAST.—Playa de las Huertas, which extends from Cabo de las 35 Huertas to the mouth of Rio Montnegre or de Castalla, about 3½ miles northward, is backed by low cultivated land, on which stand a number of buildings.

Torre de la Illeta stands about 5 miles northward of Cabo de las Huertas, and near it is a coastguard hut: La Illeta (*Lat.* 38° 26' N., 40 *Long.* 0° 23' W.) is an islet lying close inshore south-eastward of the tower. Small craft, with local knowledge, can obtain shelter from easterly winds under the lee of La Illeta.

From Torre de la Illeta the coast trends about 8 miles north-eastward to Villajoyosa and becomes higher; it is free from off-lying dangers 45 and in it are numerous coves, separated by white cliffs.

Torre Barranco del Agua and Torre del Charco stand about 2½ and 6 miles, respectively, northward of Torre de la Illeta. Close south-westward of Torre Barranco del Agua is a coastguard hut, and about one mile south-westward of Torre del Charco is the coastguard station 50 of Carrinchal. Between these two towers lie Cala del Pecheret and Cala de la Vente. Tunny nets, *see* page 27, are laid off Torre del Charco.

Charts 1187, 2717, 1766, 2158a.

Chart 1372.

Playa del Parais extends from Torre del Charco to Punta del Moro, close westward of Villajoyosa, and near the middle is the hilly Promontorio de la Niña.

- 5 **Anchorage.**—Anchorage can be obtained, during north-westerly winds, off Playa de las Huertas.

- Villajoyosa.**—**Lights.**—This town is usually known as La Vila. Its ancient part stands on the slope of a hill, with the modern town between it and the sea. It is separated from the suburb of Poble Nou, south-westward of it, by Rio Sella, a small stream.

A light is exhibited, at an elevation of 52 feet (15^m8), from a square tower, painted black and white in horizontal bands and 36 feet (11^m0) in height, situated near the coast close north-eastward of Villajoyosa.

- 15 Inland of Villajoyosa, the country is cultivated and increases in elevation, westward towards El Cabezo and northward towards Sierra Aitana, respectively, 4,009 and 5,123 feet (1,221^m9 and 1,561^m5) high. See views facing page 103.

- Rada de Villajoyosa shoals gradually and is free from off-lying dangers; it is exposed to south-easterly and south-westerly winds.

Ensenada del Alcocó, at the eastern end of Playa de Villajoyosa, is sheltered by the small rocky Punta Alcocó.

- A mole extends about one cable westward from Punta Alcocó; it affords shelter to fishing vessels of light draught. A light is exhibited from the head of this mole.

Life-saving.—A lifeboat is stationed at Villajoyosa; see page 15.

Anchorage.—Anchorage can be obtained, during offshore winds, south-eastward of the lighthouse at Villajoyosa, in depths of about 10 fathoms (18^m3), sand.

- 30 **Coast.**—From Punta Alcocó the coast trends about 2 miles east-north-eastward to Punta Plana, and in it there are a few coves available for small craft with local knowledge. El Tosal coastguard station lies close north-westward, and Torre Aguilo close northward of Punta Plana.

- 35 Cabezo del Tosal is a small but noticeable whitish promontory about half a mile north-eastward of Punta Plana; on its western side is a small cove.

- Punta de la Escaleta, high, rocky and surmounted by a tower, lies about 3 miles eastward of Cabezo del Tosal; Ensenada de Benidorme is entered between them.

- The village of Benidorme stands on a steep, rocky point, crowned by the ruins of a castle, in the middle of the head of Ensenada de Benidorme. Close southward of this point is a reef, with a depth of 2 feet (0^m6). A mole extends about one cable west-south-westward from the western side of this point, but within it considerable silting has taken place.

Tunny nets, see page 27, are laid out annually in the eastern part of Ensenada de Benidorme.

- Off-lying islet and shoal.**—**Light.**—Islote de Benidorme (Lat. 38° 30' N., Long. 0° 08' W.) lies in the approach to Ensenada de Benidorme, about 2 miles south-westward of Punta de la Escaleta; it is clifty, barren and reddish.

A flat, whitish, rocky shoal, with a depth of 19 feet (5^m8), lies about 2 cables southward of Islote de Benidorme.

Charts 1187, 2717, 1766, 2158a.

Chart 1372.

A light is exhibited, at an elevation of 62 feet (18^m9), from a white conical tower, 13 feet (4^m0) in height, situated on Islote de Benidorme.

Anchorage.—Ensenada de Benidorme affords shelter from north-westerly and north-easterly winds. 5

Anchorage, during offshore winds, can be obtained from 3 to 5 cables south-westward of the ruins of the castle at Benidorme, in depths of from 11 to 14 fathoms (20^m1 to 25^m6), muddy sand and weed.

Coast.—Light.—From Punta de la Escaleta, the coast trends about 3 miles north-eastward to Punta del Albir, and rises in precipitous, reddish cliffs to Sierra Helada. This range, when seen from south-westward or north-westward, presents a steep slope on its seaward side and a gradual decline inland. 10

Islote Mediana or Mitjana lies close inshore about one mile north-westward of Punta de la Escaleta, and is steep to on its seaward side. It cannot be distinguished against the cliff except from a short distance. 15

Islote de Pila lies close inshore about 7 cables south-westward of Punta del Albir. Other above-water rocks lie within a quarter of a mile of the foot of the cliffs.

A light is exhibited, at an elevation of 367 feet (111^m9), from a white, circular tower and dwelling, 26 feet (7^m9) in height, situated on Punta del Albir. Close north-westward of the lighthouse stand the ruins of a tower. 20

Puig de Campana, the most prominent mountain within this part of the coast, rises to an elevation of 4,710 feet (1,435^m6) about 7 miles west-north-westward of Punta del Albir, *see* view facing page 103. When seen from south-south-eastward, this mountain can easily be identified by Cuchillada de Roldán, a large and deep ravine between its summit and another peak, about half a mile south-westward and 4,482 feet (1,366^m1) high. 30

Ensenada de Altea.—Lights.—This bay is entered between Punta del Albir and Cabo Toix, about 5 miles north-eastward. Its shores are mostly sandy beaches free from off-lying dangers, and it affords shelter from south-westerly, north-westerly and north-easterly winds.

The town of Altea stands on the slope of a small hill at the head of the bay, about 2 miles northward of Punta del Albir. It is the centre of a farming district and in it stands a prominent church with high cupolas. 35

A mole extends at right angles to the coast close south-westward of Altea. 40

A light is exhibited, at an elevation of 16 feet (4^m9), from a wooden post, 16 feet (4^m9) in height, situated on the mole head.

Leading lights are exhibited, the front light, at an elevation of 36 feet (11^m0), from a wooden post, 20 feet (6^m1) in height; and the rear light, at an elevation of 47 feet (14^m3), from a wooden post on a house, 30 feet (9^m1) in height. These lights in line, bearing 339°, lead into the harbour at Altea. 45

There is berthing space of 164 feet (50^m0) at the end of the mole, with depths of 10 feet (3^m0) alongside. The extension works at the end of the mole were reported, in 1946, to have been partially destroyed. 50

No vessel should attempt to enter without local knowledge.

Cabo Negrete, about one mile north-eastward of Altea, is foul for a short distance offshore, and between it and the village lies the mouth of Rio Algar (*Lat.* 38° 36' N., *Long.* 0° 03' W.).

Charts 1187, 1766, 2158a.

Chart 1372.

Islote de Altea, with reefs between it and the beach, lies 3 cables offshore about half a mile north-eastward of Cabo Negrete, with a smaller islet about 5 cables north-north-eastward of it. Between these two islets is a cove, available only to small craft with local knowledge, on the shore of which are some warehouses.

Cabo Toix separates Ensenada de Altea from Esenada de Calpe, and the coast in its vicinity is steep and rocky; about one mile westward of it are the ruins of Torre del Mascarat.

- 10 **Anchorage.**—Anchorage can be obtained, during offshore winds, in depths of from 9 to 11 fathoms (16^m5 to 20^m1), mud and sand, south-eastward of the town of Altea, at from $5\frac{1}{2}$ to $8\frac{1}{2}$ cables offshore.

Chart 1187, plan of Calpe anchorages.

- 15 **Ensenada de Calpe.**—**Caution.**—This bay is exposed to south-easterly and south-westerly winds. Its eastern side is formed by a peninsula, the steep-to south-eastern extremity of which, Punta Ifach, is situated about $2\frac{1}{4}$ miles eastward of Cabo Toix, *see* chart 1372. The village of Calpe lies a short distance within the head of the bay.

- 20 Monte Ifach or Peñon de Calpe is 1,076 feet (328^m0) high, and somewhat resembles the Rock of Gibraltar. Its seaward sides are high, reddish cliffs; the land north-westward of it is very low, and when seen from south-westward or north-eastward, it appears as an island.

Tunny nets, *see* page 27, are laid out annually, from 1st of January to the 30th of June, close south-westward of Monte Ifach.

- 25 La Fosa is a sandy cove, on the eastern side of the isthmus of Monte Ifach (*Lat.* $38^\circ 38' N.$, *Long.* $0^\circ 04' E.$).

- 30 Punta de Mallorquin is a rocky point, about $1\frac{1}{4}$ miles north-north-westward of Punta Ifach, and from it a reef, with depths of less than one fathom (1^m8), extends about 4 cables southward, parallel with the beach.

- Puerto de Calpe.**—**Lights.**—This harbour is protected by two moles. The southern mole extends about $1\frac{1}{4}$ cables westward from about the middle of the western side of Monte Ifach, and the western mole extends southward from the shore to a position about three-quarters of a cable northward of the head of the southern mole.

A light is exhibited, at an elevation of 13 feet (4^m0), from the head of each of the two moles.

- 40 **Anchorage.**—Anchorage can be obtained, in fine weather, in a depth of $6\frac{1}{2}$ fathoms (11^m9), sand and weed, south-eastward of the village of Calpe, about $3\frac{1}{4}$ cables offshore.

Anchorage can be obtained, during westerly or south-westerly winds, off Playa de la Fosa, in a depth of 14 fathoms (25^m6), sand and mud, about half a mile offshore.

Chart 1372.

- 45 **Coast.**—Punta de las Basetas lies close northward of Punta del Mallorquin, and on it is a small tower.

- 50 From Punta de las Basetas, the coast trends about $2\frac{1}{4}$ miles north-eastward to Cabo Blanco, and is high and rocky. In it are several coves, Cala Cañaret being near the middle, but none of them is available except in fine weather, and then only to small craft with local knowledge.

Chart 1187, plan of Morayra bay.

Ensenada de Morayra.—This bay is entered between Cabo Blanco and Cabo de Morayra, about $1\frac{1}{2}$ miles east-north-eastward.

Charts 1187, 1766, 2158a.

Chart 1187, plan of Morayra bay.

Cabo Blanco (*Lat.* $38^{\circ} 40' N.$, *Long.* $0^{\circ} 07' E.$) slopes steeply down to the sea, and on the high land above it stands a tower.

Ensenada de Morayra has a rocky shore with only a few short stretches of sandy beach, on one of which, near its head, is the village of Morayra. Close westward of the village stands a small castle. 5

Anchorage.—Ensenada de Morayra affords anchorage sheltered from westerly, northerly and easterly winds, in depths of 9 fathoms (16^m5), sand or mud, about $3\frac{1}{2}$ cables southward of the castle.

Chart 1372.

Coast.—**Light.**—From Cabo de Morayra, the coast trends about 5 miles north-eastward to Cabo de la Nao, and is high and rugged. 10

Monte Isabela rises to an elevation of 1,450 feet (442^m0), one mile inland, about $2\frac{1}{2}$ miles northward of Cabo de Morayra. It is conical and easy to identify. 15

The town of Tuelada stands on a hill about $2\frac{1}{2}$ miles west-north-westward of Monte Isabela, and the village of Benitachel crowns another hill about one mile north-north-westward of Monte Isabela.

La Grandilla, a ruined fort, stands on the western entrance point of a cove; a coastguard hut stands on a hillock near a sandy beach at the head of this cove, about $1\frac{1}{2}$ miles westward of Cabo de la Nao. 20

Torre del Descubridor stands about half a mile eastward of La Grandilla, and close inshore, southward of it, is Isla del Descubridor, 187 feet (57^m0) high.

Cabo de la Nao is fairly steep-to; at its foot is a small rock near a cave. 25

A light is exhibited, at an elevation of 393 feet (119^m8), from a white, octagonal tower and dwelling, 66 feet (20^m1) in height, situated on Cabo de la Nao.

Punta del Emperador and Cabo Negro are situated, respectively, 30 about half a mile and one mile northward of Cabo de la Nao, and the coast between them is high and rugged. A detached rock, with a depth of less than 2 fathoms (3^m7), lies close northward of Cabo Negro.

Cabo de San Martin, about one mile northward of Cabo Negro, is not so high as the latter, but has a steep-sided hillock at its extremity, see 35 view facing page 103. About midway between the two capes is Isla de Portichol, 223 feet (68^m0) high, with an islet close southward of it; the passage inshore of it is shoal.

From Cabo de San Martin the coast trends about 3 miles north-north-westward to the head of Ensenada de Javea. 40

Chart 1187, plan of Javea bay.

Ensenada de Javea.—**Lights.**—**Buoy.**—This bay, in the north-western corner of which is the small Puerto de Javea, is situated on the southern side of Cabo de San Antonio, and is exposed to north-easterly and south-easterly winds. 45

A mole extends about one cable south-south-westward from Punta de la Galera. The remains of an extension to this mole, which was under repair in 1949, extend $1\frac{1}{2}$ cables farther southward.

Leading lights are exhibited, the front light (*Lat.* $38^{\circ} 48' N.$, *Long.* $0^{\circ} 11' E.$), at an elevation of 23 feet (7^m0), from a wooden post; and the rear light, at an elevation of 28 feet (8^m5), from a wooden post on the roof of a house. These lights in line, bearing 290° , lead into the harbour, clear of the buoy marking the submerged part of the mole. 50

Pilotage, see page 20, is compulsory.

Charts 1320, 1187, 1766, 2158a.

Chart 1187, plan of Javea bay.

The town of Javea stands on a hill about three-quarters of a mile west-south-westward of the port, *see* charts 1372 and 1320.

Tunny nets, *see* page 27, are occasionally laid out in Cala Sardinera, 5 the north-eastern part of Ensenada de Javea.

Anchorage.—Anchorage is prohibited between imaginary lines drawn 090° and 105° from a cable hut on the shore westward of the head of the breakwater at Javea on account of submarine telegraph cables, *see* page 19.

10 Anchorage can be obtained, in fine weather, eastward of the breakwater, and northward of the prohibited area, in depths of from 8 to 11 fathoms (14^m6 to 20^m1), sand.

Vessels of suitable draught can anchor westward of the mole, but they must not go alongside it or secure to it.

15 The landing-place is at a small mole near the custom house.

Life-saving.—Life-saving appliances are maintained at Puerto de Javea. *See* page 15.

Cabo de San Antonio. — Light. — Signal station. — This high, level promontory, falling steeply on its seaward sides, separates 20 Ensenada de Javea from Golfo de Valencia, *see* chart 1320 and view facing page 103. Its eastern side is steep-to, and about one cable south-south-westward of the lighthouse stands a hermitage. There are several windmills on a ridge about $1\frac{1}{4}$ miles westward of the lighthouse.

25 A light (*Lat.* $38^{\circ} 48' N.$, *Long.* $0^{\circ} 12' E.$) is exhibited, at an elevation of 571 feet (174^m0), from a white, circular tower with a green cupola and a dwelling attached, 53 feet (16^m2) in height, situated on the north-eastern extremity of Cabo de San Antonio. At the lighthouse there is a signal station connected with the general telegraph system.

30 The nearest of Islas Baleares, *see* page 155, lies about 45 miles east-north-eastward of Cabo de San Antonio.

Charts 1372, 1320, 1187, 1766, 2158a.

CHAPTER III

THE EASTERN COAST OF SPAIN—CABO DE SAN ANTONIO TO
CAP CERBÈRE*Chart 2158a.*

EASTERN COAST OF SPAIN.—General remarks.—The eastern coast of Spain may be considered to extend from Cabo de San Antonio to Cabo Falco, close southward of Cap Cerbère. From Cabo de San Antonio it trends about 230 miles north-eastward, forming a large bight, and thence about 25 miles northward. It is less indented and rugged than the southern coast, and through it a number of rivers flow into the sea. It is completely exposed to south-easterly winds. In most parts it is low, but it rises inland to considerable elevations, especially in its southern part. With the exception of Islotes Colum-
bretes, *see* page 123, there are no off-lying islands. It is thickly populated, but possesses no natural harbours for vessels of deep draught, though there are several artificial ones.

Chart 1320.

GOLFO DE VALENCIA.—Currents.—This bay is entered between Cabo de San Antonio (*Lat. 38° 48' N., Long. 0° 12' E.*) and Cabo de Oropesa, about 77 miles northward. Its shores are free from off-lying dangers, and can be approached in most places to about one mile. The bottom, from 2 to 20 miles offshore, is in many places rocky, and caution should be exercised when anchoring.

A vessel crossing the bay with easterly winds, especially from north to south, should exercise great caution to avoid being set inshore by the current, which sometimes attains a rate of 2 or 3 knots. This current may also be experienced in settled weather, when it is always the precursor of a north-easterly or south-easterly wind. When the rivers flowing into the bay are in spate, the current may attain rates of 4 or 5 knots. In thick weather, sounding should be continuous, and a vessel should not proceed into depths of less than 10 fathoms (18^m3).

Charts 1320, 1372.

Coast.—Caution.—From Cabo de San Antonio, the coast trends about 3 miles north-westward to Punta del Sardo, and is high and rugged, though the latter point is low and projects but little. This stretch of coast should be given a wide berth, for during onshore winds the sea breaks heavily on it, and with offshore winds, heavy squalls come off the high land.

Torre del Jarro or Agua Dulce surmounts a hillock about one mile

Charts 1187, 1766, 2158a.

Charts 1320, 1372.

south-eastward of Punta del Sardo, and between it and Punta de San Nicolás, about $1\frac{1}{2}$ miles north-eastward, the coast, which is partly rocky and partly sandy, decreases in elevation.

- 5 Monte Mongo is a prominent conical peak, 2,496 feet (760^m9) high, with a pillar on its summit. It is situated about $1\frac{1}{2}$ miles south-westward of Torre del Jarro, and from a distance appears as an island, *see* view facing page 103, but with easterly and north-easterly winds, it is usually enveloped in clouds.

10 *Chart 1458, plan of Pto. de Denia.*

Puerto de Denia.—This harbour is protected by two breakwaters. Dique Sur extends about $4\frac{1}{2}$ cables northward and thence about $1\frac{1}{2}$ cables north-eastward from the coast about 6 cables westward of Punta de San Nicolás. Dique Norte extends about $5\frac{1}{2}$ cables east-
15 south-eastward from Punta del Rasel, which point is situated about $1\frac{1}{2}$ miles north-westward of Punta de San Nicolás, and thence about $3\frac{1}{2}$ cables north-eastward, where it terminates in a circular head. Vessels exceeding 260 feet (79^m2) in length must not attempt to enter this port.

- 20 Inside the harbour, there are several wharves for vessels drawing up to 11 feet (3^m4) and some dolphins to which vessels can secure their sterns. There are four berths available to vessels 260 feet (79^m2) in length, drawing up to 16 feet (4^m9). Alongside Muelle Nuevo there are depths of 17 feet (5^m2), and alongside Muelle de Atraque of 18 feet
25 (5^m5).

Castillo de Denia stands on a hillock near the head of the harbour, and is a good landmark. South-eastward and south-westward, respectively, of the castle are the spire of the convent of San Francisco, and the square-topped belfry of the church.

- 30 **Dangers.**—Escollo de San Nicolás is an above-water reef close off Punta de San Nicolás; between it and the inner part of Dique Sur is Placer de San Nicolás, with depths of less than one fathom (1^m8).

El Blancar, with depths of less than one fathom (1^m8), lies about 4 cables north-north-eastward of the root of Dique Sur (*Lat.* 38°

- 35 50' N., *Long.* 0° 07' E.).

La Androna, with a depth of 11 feet (3^m4), lies northward of El Blancar; its northern part projects into the entrance channel beyond the north-eastern part of Dique Sur.

- Placer de la Placeta, with depths of less than 2 fathoms (3^m7), is
40 an extensive bank of weed, mud and rock, which borders the coast westward of El Caballo.

- Lights.—Beacons.—Light-buoy.**—Leading lights are exhibited, the front light, at an elevation of 33 feet (10^m1), from a post situated on the wharf about $3\frac{1}{2}$ cables north-westward of the root of Dique
45 Sur; and the rear light, at an elevation of 46 feet (14^m0), from a mast, 39 feet (11^m9) in height, situated about one cable south-westward of the front light-structure. These lights in line, bearing 228°, lead through the entrance channel.

- A light is exhibited, at an elevation of 33 feet (10^m1), from an iron
50 mast, 30 feet (9^m1) in height, situated near the head of Dique Norte.

A light is exhibited, at an elevation of 24 feet (7^m4), from an iron mast, 20 feet (6^m1) in height, situated near the head of Dique Sur.

The north-western side of the entrance channel is marked by two lighted and one unlighted beacons. A conical light-buoy, painted

Charts 1187, 1766, 2158a.

Chart 1458, plan of Pto. de Denia.

black and exhibiting a *green fixed* light, marks the south-western extremity of the shoal bank encumbering the northern part of the harbour.

Anchorage.—Pilotage.—There is anchorage for vessels which cannot enter the harbour, with the leading light-structures in line, bearing 228° , and Cabo de San Antonio lighthouse bearing 143° , in depths of 14 fathoms (25^m6), muddy sand. The currents in this anchorage usually set in the direction of the prevailing wind.

Pilotage, *see* page 20, is compulsory; pilots should be embarked 10 within about $1\frac{1}{2}$ miles of the entrance. The pilots' boats are painted black with the letter P in white on each side, and fly a blue flag on which also is the letter P in white. In bad weather, the pilot may come out in the life-boat.

Life-saving.—A motor lifeboat is stationed, and life-saving appliances are maintained, at Denia; *see* page 15.

Port facilities.—Fresh provisions and water are obtainable. A small stock of coal is maintained. Some lighters are available, but, in 1946, they were reported to be in poor condition. There is a slipway for vessels up to about 50 tons. There is a 10-ton floating crane. 20

A hospital is situated in Denia.

Chart 1320.

Coast.—From Punta del Rasel, the coast, which consists of low, sandy beaches, trends about 4 miles west-north-westward to Torre de la Almadraba (*Lat. $38^{\circ} 52' N.$, Long. $0^{\circ} 01' E.$*). 25

Rio del Molinell flows into the sea about 2 miles westward of Torre de la Almadraba, and near its mouth stands a building.

Algar de la Almadraba is an area of foul ground, with depths of from 14 to 20 fathoms (25^m6 to 36^m6), lying off this stretch of coast, over which heavy seas are raised by onshore winds. 30

The town of Oliva stands at the foot of a hillock, about $1\frac{1}{2}$ miles inland, about $5\frac{1}{2}$ miles north-westward of the mouth of Rio del Molinell, and nearly midway between is the mouth of Rio Bullent.

Torre de Piles is circular and stands near the beach about 2 miles northward of Oliva; near it are several buildings, and inland of it 35 are the villages of Miramar and Piles.

From Torre de Piles the sandy coast trends about $2\frac{1}{2}$ miles north-westward to the mouth of Rio Serpis or Alcoy, close northward of which is Puerto de Gandia.

Chart 1320, plan of Puerto de Gandia. 40

Puerto de Gandia.—Lights.—This harbour, which is situated at the mouth of Riachuelo de San Nicolás, is protected by two breakwaters. Dique del Norte extends about $3\frac{1}{2}$ cables eastward from the northern entrance point of the river; Dique del Sur extends about $1\frac{1}{2}$ cables north-eastward from its southern entrance point. The entrance, between the heads of the breakwaters, is about 390 feet (118^m9) wide. From the root of Dique del Sur, Dique de Serpis extends about 2 cables south-eastward.

A light is exhibited, at an elevation of 44 feet (13^m4), from a grey, iron column, 20 feet (6^m1) in height, situated about 130 feet (39^m6) 50 within the head of Dique del Norte (*Lat. $39^{\circ} 00' N.$, Long. $0^{\circ} 09' W.$*).

A light is exhibited, at an elevation of 18 feet (5^m5), from a stone hut, 8 feet (2^m4) in height, situated about 420 feet (128^m0) within the head of Dique del Norte.

Charts 1187, 1766, 2158a.

Chart 1320, plan of Puerto de Gandia.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron tripod, 7 feet (2^m1) in height, situated on the head of Dique del Sur.

On the southern side of the harbour are two wharves, respectively 5 500 and 1,000 feet (152^m4 and 304^m8) long; these wharves are connected with the railway system and are fitted with cranes. The smaller wharf is used for discharging coal. There is a mooring buoy at the head of the harbour.

In 1950, owing to silting in the entrance and in the harbour, only 10 vessels of less than 13 feet (4^m0) draught and less than 230 feet (70^m1) in length could be accommodated.

The town of Gandia is situated in a cultivated plain. Agricultural produce is exported; coal and general merchandise are imported. Pilots are available. There is a signal tower at the eastern end of 15 the coal wharf. Water is laid on to the wharves. Minor repairs can be effected. For deratisation, *see* page 22. A British Consular officer resides in Gandia (Lat. 39° 00' N., Long. 0° 10' W.).

Chart 1320.

Anchorage.—With offshore winds, anchorage can be obtained off 20 Puerto de Gandia, in depths of from 3½ to 5½ fathoms (5^m9 to 10^m1), sand and mud, with the belfry on the tiled roof of the hermitage of San Nicolás at Gandia in line with Picacho de la Renguera, 1,483 feet (452^m0) high, bearing about 251°; vessels should not anchor northward of this alignment on account of El Mitjanet, *see* below.

25 **Life-saving.**—Life-saving appliances are maintained at Puerto de Gandia; *see* page 15.

Coast.—From Puerto de Gandia, the low, sandy coast trends about 10 miles north-north-westward to the mouth of Rio Júcar.

El Mitjanet, a rocky patch, with depths of from 5½ to 6½ fathoms 30 (9^m6 to 11^m9), lies parallel with the coast and about 4 cables offshore, within about half a mile northward of Puerto de Gandia.

La Viñeta is one of several rocky patches, with depths of from 5½ to 11 fathoms (10^m1 to 20^m1), which lie within one mile of the coast between El Mitjanet and the mouth of Rio Júcar.

35 Torre La Valle lies 6½ and Torre del Júcar 9½ miles north-north-westward of Puerto de Gandia. Each tower is circular and is a coastguard station; near each stand other buildings.

Rio Júcar is shallow and its mouth is encumbered by a bar.

Chart 1458, plan of Rada de Cullera.

40 **Rada de Cullera.**—**Danger.**—**Beacon.**—The town of Cullera stands on the left bank of Rio Júcar about one mile from its mouth, at the foot of Monte de las Zorras, which latter rises to an elevation of 728 feet (221^m9) at the southern end of Sierra de Cullera.

Escollo de Moro is a small, pointed, above-water rock, on which is 45 a red, pyramidal, iron beacon, 18 feet (5^m5) in height, about three-quarters of a mile south-eastward of the hermitage of San Antonio, which latter stands at the foot of the eastern slope of Monte de las Zorras.

The hermitage of Santa Marta, on the slopes of Sierra de Cullera, 50 about three-quarters of a mile northward of that of San Antonio, stands out on account of its whiteness.

La Lloseta, a small rock with a depth of less than 2 feet (0^m6), lies close inshore south-eastward of the hermitage of Santa Marta.

Puntas Negra, del Medio, and de los Pensamientos are three rocky

Chart 1458, plan of Rada de Cullera.

points on the northern side of the roadstead within $1\frac{1}{2}$ miles eastward of the hermitage of Santa Marta, and from the first-named, the ruins of a small mole extend southward.

Anchorage.—With offshore winds, anchorage could be obtained 5 about $3\frac{3}{4}$ cables northward of the beacon on Escollo del Moro, in a depth of about $3\frac{1}{4}$ fathoms (6^m4), or about the same distance southward of the beacon, *see* chart 1320, in a depth of about $3\frac{3}{4}$ fathoms (6^m9).

Coast.—Light.—Beacon.—Sierra de Cullera rises steeply from the coastal plains, and at a distance may be mistaken for an island. 10

Cabo de Cullera, at the eastern end of Sierra de Cullera, is a steep point about 4 cables northward of Punta de los Pensamientos, and between them is an old watch tower (*Lat.* $39^{\circ} 11' N.$, *Long.* $0^{\circ} 13' W.$), standing on a rocky hill, 147 feet (44^m8) high. Navarros hermitage stands close northward of this watch tower, and there are other 15 buildings in the vicinity.

A light is exhibited, at an elevation of 92 feet (28^m0), from a white, conical tower, 52 feet (15^m8) in height, situated on Cabo de Cullera. *Chart 1320.*

From Cabo de Cullera, the low sandy coast trends about 17 miles 20 north-north-westward to Valencia, and may be approached in safety to a distance of about one mile.

Ermita de los Santos de Sueca, $2\frac{1}{2}$ miles inland and about $5\frac{1}{4}$ miles north-westward of Cabo de Cullera, stands on a hillock, 125 feet (38^m1) high, in the middle of the coastal plain and is a good mark. 25

Casa del Rey, with several buildings inland of it, is a square tower used as a coastguard station, about $2\frac{1}{2}$ miles eastward of Ermita de los Santos de Sueca and about 3 cables inland.

A reef extends about 3 cables from the coast about half a mile north-north-eastward of Casa del Rey. 30

Gola del Perello and Gola del Perellonet, about $1\frac{1}{2}$ and $3\frac{1}{2}$ miles, respectively, northward of Cruz del Moro, are the shallow entrances of Albufera de Valencia, and are periodically choked with sand; near the first-named are some fishermen's huts and a coastguard station.

Albufera de Valencia is a shallow lake that is separated from the sea 35 by a low, narrow bank of sand.

Isla del Palmar lies at the south-eastern end of the lake, and on it is a village with a church, both of which are prominent from seaward.

Torre Nueva stands on the coast about $1\frac{1}{4}$ miles northward of Gola del Perellonet. 40

El Saler is a village with a square turret in its south-western part, situated half a mile inland, about 3 miles northward of Torre Nueva (*Lat.* $39^{\circ} 23' N.$, *Long.* $0^{\circ} 20' W.$).

La Dehesa is a grove of pine trees which covers most of the sandy barrier from Gola del Perellonet to El Saler. 45

Chart 562.

PUERTO DE VALENCIA.—This harbour is protected by breakwaters and consists of Antepuerto and Darsenas Nos. 1, 2 and 3.

Muelle del Turia, on the western side of Darsena No. 1, extends about $4\frac{1}{2}$ cables southward from the eastern entrance point of Rio Turia, 50 and thence extends about $5\frac{1}{2}$ cables eastward under the name Dique del Sur.

Muelle de Levante, on the eastern side of the harbour, extends

Charts 1187, 2158a.

Chart 562.

about 6 cables south-south-eastward from the coast and thence extends about $1\frac{1}{2}$ cables east-south-eastward under the name Muelle de Llovera.

Dique del Norte extends about 6 cables eastward from the head of 5 Muelle de Llovera. From the head of Muelle de Llovera, Espignon del Norte extends about $1\frac{1}{4}$ cables southward.

Dique del Este, which protects Antepuerto, extends about $4\frac{1}{4}$ cables south-south-westward and westward, from a position about $2\frac{1}{4}$ cables west-south-westward of the head of Dique del Norte to a position 10 about one cable south-south-eastward of the head of Dique del Sur.

Muelle Transversal de Poniente and Muelle Transversal de Levante separate Darsena No. 2 from Darsena No. 3.

From the root of Muelle Transversal de Poniente, Muelle de Poniente extends about 2 cables south-eastward on the south-western side of 15 Darsena No. 2.

From a position about one cable southward of Muelle de Poniente a mole extends about one cable south-eastward from the reclaimed land at the northern end of Muelle de Turia. From the south-eastern end of this mole a spur projects about $1\frac{1}{2}$ cables south-eastward.

20 In 1948, the general depths in the harbour were reported to 30 feet (9^m1).

Lights.—A light is exhibited, at an elevation of 82 feet (25^m0), from a pyramid masonry tower on an octagonal base, 72 feet (21^m9) in height, situated on the head of Dique del Norte.

25 A light is exhibited, at an elevation of 40 feet (12^m2), from an iron structure, 17 feet (5^m2) in height, situated close south-eastward of the light-structure on the head of Dique del Norte; this light-structure should not be approached within 82 feet (25^m0).

A light is exhibited, at an elevation of 41 feet (12^m5), from a red, 30 iron, framework tower, 28 feet (7^m8) in height, situated on the northern end of Dique del Este, which latter should not be approached within 33 feet (10^m1).

A light is exhibited, at an elevation of 39 feet (11^m9), from a green iron, framework tower, 32 feet (9^m8) in height, situated on the south- 35 western end of Dique del Este, which latter should not be approached within 33 feet (10^m1).

A light is exhibited, at an elevation of 40 feet (12^m2), from a red, iron, framework tower, 33 feet (10^m1) in height, situated on the eastern end of Dique del Sur, which latter should not be approached within 40 33 feet (10^m1).

A light (*Lat.* 39° 27' N., *Long.* 0° 19' W.) is exhibited, at an elevation of 45 feet (13^m7), from an iron column, 36 feet (11^m0) in height, situated on the head of Espignon del Norte.

A light is exhibited, at an elevation of 27 feet (8^m2), from an iron 45 column, 18 feet (5^m5) in height, situated on the north-eastern corner of the head of Espignon No. 1.

A light is exhibited, at an elevation of 19 feet (5^m8), from a wooden post, 11 feet (3^m4) in height, situated on the south-western corner of the head of Espignon No. 1.

50 Two lights are exhibited, at elevations of 30 feet (9^m1), from iron columns, 23 feet (7^m0) in height, situated, one on the head of Muelle Transversal de Poniente and the other on the head of Muelle Transversal de Levante.

Pilotage.—Pilotage is compulsory; see page 20.

Charts 1320, 1187, 2158a.

Chart 562.

Directions. — Anchorage. — North-north-easterly winds usually cause a heavy swell to set west-south-westward across the entrance to the harbour.

Vessels seldom anchor outside the harbour, and the anchorage is not recommended, especially in winter, as it is exposed to easterly winds. Anchorage can be obtained, in depths of from $6\frac{1}{2}$ to $8\frac{1}{2}$ fathoms (11^m9 to 15^m5), sand and mud, about half a mile northward of Dique del Norte. Care must be taken to avoid anchoring in the area bounded southward by the alignment of the belfry of the cathedral with the north-eastern corner of the custom house at the head of Darsena No. 3, bearing about 287° , and northward by the alignment of the church steeple of Los Angeles with the coastguard hut at Cabañal, bearing 265° , for in this area lies Algar del Cabañal, a large, stony bank covered with weed, which has depths of from 6 to 13 fathoms (11^m0 to 23^m8). 15

Port facilities.—The quays are connected with the railway system, and there are a number of cranes on them. There are also floating cranes, one of 300-tons capacity. Lighters are available.

Supplies of all kinds can be procured; water is laid on to the quays or can be obtained from tank vessels. 20

Repairs can be executed. A floating dock is moored in the angle formed by the head of the mole southward of Muelle Transversal de Poniente and the root of Espignon No. 1; for details *see* page 486.

Stocks of coal and fuel oil are maintained.

For deratisation, *see* page 22. 25

Life-saving.—Two life-boats are stationed, and life-saving appliances are maintained, at Puerto de Valencia. *See* page 15.

Communications.—There is steamer communication with other Mediterranean ports, New York and Habana.

Chart 1320. 30

Valencia.—This city stands on a fertile plain about 2 miles inland and is prominent from seaward; in it are many tall steeples and towers; the octagonal belfry of the Cathedral, 265 feet (80^m8) high, being the highest.

Rio Turia flows through the northern part of the city and its mouth is close westward of the harbour, *see* chart 562. At the mouth of this river is a bar, which is dry except in winter or after heavy rains, and off this bar a shoal bank is constantly extending. 35

The principal exports are oranges, onions, rice, wines, spirits, &c. The chief imports are coal, wood, iron, fertilizers, coffee, cocoa, sugar, 40 cereals, &c.

A British Consular officer resides in Valencia.

COAST.—From Puerto de Valencia the coast trends about $12\frac{1}{2}$ miles north-north-eastward to Puerto de Sagunto. It consists of a sandy beach and is clear of off-lying dangers; it may be approached to within one mile, in fine weather. 45

Torre del Puig, with a coastguard hut close to it, stands near the beach about $7\frac{1}{2}$ miles northward of the root of Muelle de Levante.

A short distance inland a series of villages form an almost continuous line of detached buildings. 50

Algaras de Albuixech and del Puig are rocky patches, with depths of from 8 to 11 fathoms (14^m6 to 20^m1), lying off this stretch of coast.

Grao de Murviedro (*Lat.* $39^\circ 38' N.$, *Long.* $0^\circ 15' W.$) lies about

Charts 1320, 1187, 2158a.

Chart 1320.

7½ miles southward of Puerto de Sagunto, and on it are some warehouses. About half a cable offshore is a reef, with depths of less than one fathom (1^m8).

- 5 **Measured distance.**—A measured distance of 8,301 feet (2,530^m4) is situated in the neighbourhood of Torre de Puig. The northern limit is indicated by the alignment of the south-eastern turret of the convent of Puig with a tower or pillar, situated on the beach and 46 feet (14^m0) high, bearing 285°. The southern limit is indicated by
10 the alignment of the church at Masamagrell with a tower or pillar situated on the beach and 53 feet (16^m8) high, bearing 285°. The running course is 015° or 195°.

- Anchorage.**—Anchorage can be obtained, by vessels with local knowledge, off Grao de Murvidro, in depths of from 5½ to 6½ fathoms
15 (10^m1 to 11^m9), sand.

Chart 1320, plan of Puerto de Sagunto.

- Puerto de Sagunto. — Lights. — Buoys. — Directions.** — This small artificial harbour belongs to a private firm. It is protected by a mole which extends about 3½ cables south-eastward from the
20 coast, and thence about one cable southward. About 1½ cables from the root of the mole a short spur extends south-westward. In 1950 the greater part of the entrance channel had been dredged to a depth of 24 feet (7^m3). On the mole is an iron gantry, 33 feet (10^m1) in height, for loading ore. Water is laid on to the mole.

- 25 A light is exhibited, at an elevation of 38 feet (11^m6), from a white, circular, iron tower, 27 feet (8^m2) in height, situated about three-quarters of a cable within the head of the mole.

- Leading lights are exhibited, the front light, at an elevation of 45 feet (14^m6), from an iron column, 33 feet (10^m1) in height, situated
30 about 2½ cables north-westward of the light near the head of the mole ; and the rear light, at an elevation of 66 feet (20^m1), from the corner of a building, 52 feet (15^m8) in height, situated about three-quarters of a cable northward of the front light-structure.

- Two conical buoys are moored near the edge of a shoal spit, which,
35 with depths of less than 3 fathoms (5^m5), extends about 2 cables southward of the mole head (*Lat.* 39° 39' N., *Long.* 0° 13' W.).

There are two mooring buoys westward of the spur.

- A vessel entering the harbour should steer with the leading light-structures in line, bearing 353°, passing between the two conical
40 buoys southward of the mole head.

On the beach close northward of the root of the mole are several buildings and tall chimneys ; the southernmost chimney is marked by two lights.

Chart 1320.

- 45 **Coast. — Danger. — Lights.** — Cabo Canet is a sandy point, on the northern side of Rio Palancia, situated about one mile north-north-eastward of Puerto de Sagunto, and near it is a coastguard hut. Shifting sandbanks form off the mouth of the river during freshets.

- A light is exhibited, at an elevation of 108 feet (32^m9), from a grey
50 tower, in the form of a truncated cone on an octagonal base, 98 feet (29^m9) in height, situated on Cabo Canet.

From Cabo Canet, the low sandy coast trends about 13 miles north-north-eastward to Puerto de Burriana ; near it stands some dilapidated towers and several coastguard huts.

Charts 1187, 2158a.

Chart 1320.

Pico de Espadan rises, about 13 miles inland, to an elevation of 3,625 feet (1,104^m9). It stands about 16 miles north-north-westward of Cabo Canet and is the most prominent distant landmark along this stretch of coast. 5

A small, detached, 3-fathom (5^m5) sandy shoal lies about 1½ miles offshore, 4½ miles north-north-eastward of Cabo Canet.

Moncófar is a small seaside town about 8½ miles north-north-eastward of Cabo Canet (*Lat.* 39° 48' N., *Long.* 0° 08' W.).

A privately maintained light is exhibited, at an elevation of 34 feet (10^m4), from an iron structure, 27 feet (8^m2) in height, situated at Moncófar. 10

Chart 1571, plan of Grao de Burriana.

Puerto de Burriana. — Dangers. — Lights. — Puerto de Burriana is protected by two moles. Dique de Levante extends about 15 5½ cables south-eastward and southward from the coast. Dique de Poniente extends about 4½ cables south-eastward and eastward from a position on the coast about 3 cables south-westward of the root of Dique de Levante. A transverse mole extends south-westward from the middle of Dique de Levante, forming the south-eastern side of an inner basin. The entrance to the harbour faces south-westward. 20 In 1949, there were depths of 23 feet (7^m0) in the entrance channel; of from 19 to 20 feet (5^m8 to 6^m1) in the outer part of the harbour; and of from 14 to 18 feet (4^m3 to 5^m5) in the inner part. There are numerous wooden buildings near the head of the harbour. 25

A shoal, with a depth of 3 fathoms (5^m5), sand, lies about 5 cables south-westward of the head of Dique de Levante.

In 1918 a vessel, drawing 21 feet (6^m4), grounded about 3 cables south-eastward of the head of Dique de Levante.

A detached 1½-fathom (2^m7) patch is situated about 6½ cables north-eastward of the head of Dique de Levante. 30

In 1948, the depths in the approach to Puerto de Burriana had shoaled considerably, and a vessel should await a pilot not less than half a mile from the entrance.

A light is exhibited, at an elevation of 39 feet (11^m9), from a black, iron tower, 26 feet (7^m9) in height, situated on the head of Dique de Levante. 35

A light is exhibited, at an elevation of 33 feet (10^m1), from a black, iron tower, 26 feet (7^m9) in height, situated on the head of Dique de Poniente. 40

A light is exhibited, at an elevation of 33 feet (10^m1), from a black, iron tower, 26 feet (7^m9) in height, situated on the head of the transverse mole. 40

Grao de Burriana, near the middle of Playa de Grao, lies close southward of the mouth of Rio Bechi or Seco, about one mile north-eastward of the harbour. On the beach stands a row of houses, close northward of which is a tower. About three-quarters of a mile north-eastward of the tower, and about one-quarter of a mile inland, is a prominent clump of eucalyptus trees, about 100 feet (30^m5) high. 45

Rio Bechi only flows in winter, but then causes extensive flooding. 50

Playa de Grao is intersected by a number of watercourses southward of the mouth of the river.

Burriana is an important town, situated on the southern bank of Rio Bechi, about 1½ miles inland.

Charts 1187, 2158a.

Chart 1571, plan of Grao de Burriana.

Anchorage. — **Caution.** — There is anchorage, in depths of $5\frac{1}{2}$ fathoms (10^m5), about $2\frac{1}{2}$ cables southward of the head of Dique de Levante.

- 35 Anchorage can be obtained anywhere off Playa de Grao in depths of from $5\frac{1}{2}$ to $6\frac{1}{2}$ fathoms (10^m1 to 11^m9), sand or weed, but the local pilots prefer to anchor off its southern part, where the bottom is cleaner; the anchorage, however, is exposed to onshore winds.

Chart 1320.

- 10 **Coast.**—From the mouth of Rio Bechi, the low, sandy coast trends about 3 miles north-eastward to the mouth of Rio Mijares or Millares, and thence about $3\frac{1}{2}$ miles north-north-eastward to Puerto del Grao de Castellón.

Chart 1571, plan of Castellón de la Plana.

- 15 **Puerto del Grao de Castellón.**—**Danger.**—**Buoy.**—**Lights.**—

Puerto del Grao de Castellón is an artificial harbour. Dique de Poniente extends about $4\frac{1}{2}$ cables east-south-eastward and thence about $1\frac{1}{2}$ cables east-north-eastward from the coast. Dique de Levante extends about $6\frac{1}{2}$ cables south-eastward from the coast. From near the middle of

- 20 Dique de Levante, a transverse mole extends southward dividing the harbour into an inner and an outer basin. At the head of the inner basin there is a wharf connected with the railway system. In 1949, works were in progress to extend Dique de Levante southward. The extremity of these works is marked by a black can buoy, surmounted
25 by a cone. Vessels should leave this buoy on the starboard hand when entering the harbour. Works were also in progress to construct a harbour for fishing vessels, southward of and parallel with Dique de Poniente, and are marked by a *white fixed* light and a small white buoy. In the south-western corner of the harbour are two wireless masts.

- 30 A depth of 26 feet (7^m9) can be carried to the inner harbour; the axis of the dredged channel is marked by the alignment of two beacons, bearing 274° ; the front one has a circular topmark with white horizontal bands, and the rear one has a rectangular topmark with red and white bands; from each beacon a *red* light is exhibited. The western
35 edge of the dredged portion in the inner basin is marked by the alignment of two posts bearing 332° , from which *green* lights are exhibited.

A light (*Lat.* $39^\circ 58' N.$, *Long.* $0^\circ 01' E.$) is exhibited, at an elevation of 52 feet (15^m8), from an octagonal masonry tower and dwelling, 20 feet (6^m1) in height, situated on the head of Dique de Levante.

- 40 A light is exhibited, at an elevation of 24 feet (7^m3), from a grey column, 15 feet (4^m6) in height, situated on the head of Dique de Poniente.

A light is exhibited, at an elevation of 23 feet (7^m0), from a post, 16 feet (4^m9) in height, situated on the head of the transverse mole.

- 45 **Pilotage,** *see* page 20, is compulsory.

For deraisation, *see* page 22.

Grao de Castellón is the name of the settlement at the port.

Playa del Grao de Castellón is free from off-lying dangers, and the depths shoal regularly towards it.

- 50 Entina del Estany is a small rocky patch, with depths of from 2 to 3 fathoms (3^m7 to 5^m5), within half a mile of the beach, about $1\frac{1}{2}$ miles northward of the harbour.

The town of Castellón de la Plana is visible from seaward, and stands in a fertile plain about $2\frac{1}{2}$ miles north-westward of the port.

Charts 1187, 2158a.

Chart 1458, plan of Olla de Benicasim.

Olla de Benicasim.—**Danger.**—Torre de Benicasim or de San Vicente stands on the coast about 5 miles north-north-eastward of Puerto del Grao de Castellón, *see* chart 1320, and about $1\frac{1}{2}$ miles north-eastward of it are the ruins of Torre de San Julián. 5

The town of Benicasim stands, at the foot of a hill, about one mile north-westward of Torre de Benicasim.

Olla de Benicasim is the name of the roadstead off Torre de Benicasim; southward of the tower its shore is rocky, but between that tower and the ruins of Torre de San Julián it is sandy. 10

A shoal, on which a vessel grounded, in 1918, lies in the southern part of the roadstead, about 2 miles southward of the church at Benicasim, and about 9 cables offshore.

Anchorage.—Anchorage can be obtained, in depths of from 4 to 6 fathoms (7^m3 to 11^m0), from one to $1\frac{1}{2}$ miles offshore, with the tower of the church in Benicasim in line with Ermita del Padre Bartolo, *see* below, bearing 319° ; but a better position is, in depths of from $4\frac{1}{2}$ to 6 fathoms (8^m2 to 11^m0), about the same distance offshore, with the church tower in line with the convent of Desierto de las Palmas, bearing 301° . 20

Chart 1320.

Coast.—**Light.**—**Aspect.**—From Torre de San Julián, the coast curves eastward and north-eastward for about 3 miles to Cabo de Oropesa, and is rocky and somewhat indented.

Cabo de Oropesa is fairly salient and has a small point close southward of it and an islet close inshore on its northern side. The village of Oropesa stands on a hillock about half a mile north-westward of the cape. 25

A light (*Lat.* $40^\circ 05' N.$, *Long.* $0^\circ 08' E.$) is exhibited, at an elevation of 75 feet (22^m9), from a white, circular tower and dwelling, 39 feet (11^m9) in height, situated on Cabo de Oropesa, and close to it is an old watch tower.

Los Colls are a range of mountains, from $2\frac{1}{2}$ to 5 miles inland, westward of Cabo de Oropesa. *See* view facing page 124.

Ermita del Padre Bartolo crowns Monte Pinos, the highest summit of Los Colls, at an altitude of 2,414 feet (735^m8). 35

Peña Golosa, nearly 20 miles west-north-westward of Monte Pinos, rises to an elevation of 5,960 feet ($1,816^m6$).

Chart 1458, plan of Islotes Columbretes.

ISLOTES COLUMBRETES.—This small archipelago of volcanic islets and shoals lies with Columbrete Grande, the north-easternmost islet, about 27 miles east-south-eastward of Cabo de Oropesa, *see* chart 1320, and views facing pages 124 and 125, and on chart 1458. It consists of four groups and one out-lying sunken rock, with deep channels between them. 45

The islets are in most places steep-to, and the greater part of their coasts is inaccessible.

North-easterly winds raise a heavy sea not only in the vicinity of the archipelago, but also between it and the coast of the mainland.

The southernmost group should be given a wide berth, and the 50 passage between the two middle ones should not be used.

Chart 1320.

Off-lying danger.—La Barra Alta, a small rocky shoal, with a

Charts 1187, 2158a.

Chart 1320.

depth of 6 fathoms (11^m0), lies about 8 miles south-westward of the lighthouse in Columbrete Grande, *see* below.

Chart 1458, plan of Islotes Columbretes.

- 5 **El Bergantin.—Dangers.**—This islet (*Lat.* 39° 51' N., *Long.* 0° 40' E.), situated about 2½ miles southward of Columbrete Grande, is a remarkable columnar rock, 105 feet (32^m0) high, which at a distance appears like a square-rigged vessel under sail. It is steep-to on its western side, but within about 1½ cables north-eastward and eastward
10 of it are numerous above-water and sunken rocks.

Banco Ulloa, with a depth of 10 fathoms (18^m3), lies about 1½ cables westward of El Bergantin, and about the same distance southward of the latter is a rock with a depth of 5½ fathoms (9^m6).

- 15 Isote de Cerquero, 20 feet (6^m1) high, is one of the rocks on the eastern side of El Bergantin, and about one-quarter of a mile south-south-eastward and north-north-eastward of it, respectively, are Banco Patiño and Banco Mendoza, with least depths of 6 fathoms (11^m0).

- Isote de Churruca, 10 feet (3^m0) high, lies about 3 cables eastward of El Bergantin, and close southward of it is an above-water rock,
20 named Baleato, with a 6-fathom (11^m0) rock about one cable south-south-westward of it.

Banco Luyando, the south-easternmost danger in this group, has a least depth of 3 feet (0^m9), and lies within 2 cables south-eastward of Baleato; it is usually marked by breakers.

- 25 **La Horadada.—Dangers.**—This islet is 180 feet (54^m9) high, and lies about 1½ miles northward of El Bergantin.

Mendez Nunez is a much smaller islet lying close eastward of La Horadada, with El Lobo between them. Foul ground extends north-eastward and eastward from Mendez Nunez for a short distance.

- 30 Piedra Joaquin is an above-water rock about 1½ cables north-north-westward of La Horadada; it lies on a small shoal with depths of less than 3 fathoms (5^m5).

- Banco de Don Jorge Juan, about 1½ cables north-north-westward of Piedra Joaquin, is a small rocky bank, with a depth of about
35 9 fathoms (16^m5), lying almost in the middle of the channel between the Horadada and Ferrera groups.

La Ferrera.—Dangers.—This islet is saddle-shaped and 144 feet (43^m9) high; it lies nearly one mile northward of La Horadada.

- El Bauza, 72 feet (21^m9) high, is pyramidal in shape, and is separated
40 from the north-eastern side of La Ferrera by a narrow and foul channel.

El Espinosa is a much smaller islet close off the north-eastern side of El Bauza, and Valdes, a similar islet, lies close south-eastward of La Ferrera.

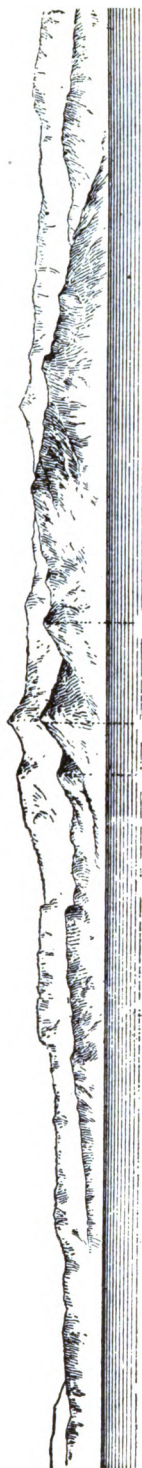
- Navarrete is an islet, about one cable south-westward of the south-
45 western extremity of La Ferrera, and from it a reef extends south-westward for about one cable.

Banco Ciscar, with depths of about 6 feet (1^m8), lies about half a cable south-eastward of Navarrete.

- Banco Fidalgo, with depths of from one to 9 fathoms (1^m8 to 16^m5),
50 lies about one cable southward of Valdes.

Columbrete Grande.—Light.—This, the largest islet of the group, is in the form of a crescent and lies about three-quarters of a mile north-eastward of La Ferrera. It is highest at its northern and southern points, where it attains elevations of 213 and 148 feet (64^m9 and

Peña Golosa,
bearing 300°, 47½ miles.



Los Colls.

*Ermita del
Padre Bartolo,*
bearing 303°, 28 miles.

Los Colls from south-eastward.



*La Ferrera. Columbrete
Grande lighthouse,*
bearing 000°, 8 miles.

La Horadada.

El Bergantín.

Islotes Columbretes from south-westward.



La Ferrera. El Bauza.

La Horadada.

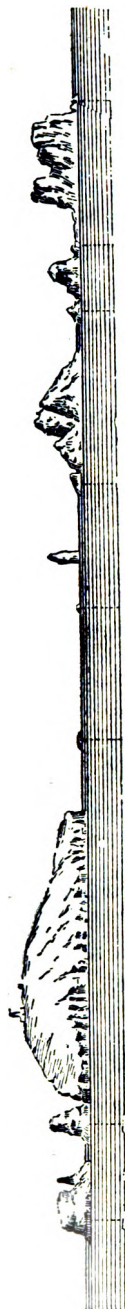
Columbrete Grande.

*El Mascaret,
Isle de Manicobre.*
El Bergantín,
bearing 022°, 1½ miles.

*Isle de
Cerquero.*

Islotes Columbretes from southward.

(Originals dated 1893.)



Isote
Mancolitre.
El Mascard.

Columbrete Grande.

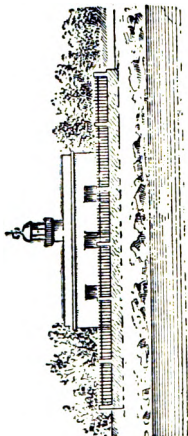
El Bergantin.

La
Horadada.

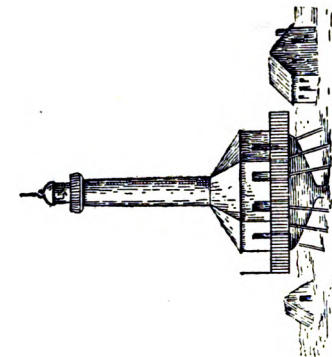
El Bauza.

La Ferrera,
bearing 190°,
4 miles.

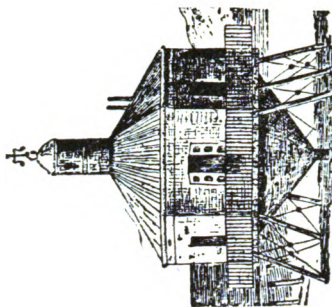
Islotes Columbretes from northward.
(Original dated 1893.)



San Carlos de la Rápida
lighthouse.
(Original dated prior to 1937.)



Punta de la Baña
lighthouse.
(Original dated prior to 1937.)



Puerto del Fangar
lighthouse.
(Original dated prior to 1937.)

Chart 1458, plan of Islotes Columbretes.

45^m1), respectively, and its low central part is composed of lava and rock. Cabo de Rosi lies on its north-western side, and Punta de Michorn is its south-easternmost extremity; close westward of the latter is a cove named La Cueva (*Lat.* 39° 54' N., *Long.* 0° 41' E.). 5

A light is exhibited, at an elevation of 279 feet (85^m0), from a white conical tower surmounting a white dwelling, 66 feet (20^m1) in height, situated on the summit of the northern end of Columbrete Grande.

El Mascarat, La Señoreta, and Islote Mancolibre, respectively 115, 69, and 98 feet (35^m0, 21^m0, and 29^m9) high, lie in that order 10 north-eastward of Punta de Michorn. There are boat passages on either side of the first-named, but the other two are almost joined together.

Puerto Tofino is entered between the chain of islets, just described, and the north-eastern end of Columbrete Grande. It is open north- 15 eastward, and has foul ground near its head. A small buoy is moored in the centre of the bay. The bay affords no shelter, except to small craft during westerly winds, and then only in settled weather during the summer.

Chart 1320.

20

COAST.—Danger.—From Cabo de Oropesa, *see* page 123, the coast trends about 9 miles north-north-eastward to Capicorp and for the greater part is backed by marshes. Its southern part is fringed with rocks, but they do not extend far offshore. Several streams debouch on this stretch of coast, the largest being Barranco Chinchilla, 25 about one mile northward of the cape.

Castillo Albalat and three towers crown the summits of a chain of small hills about one mile inland and some 5 miles northward of Cabo de Oropesa.

A shoal, on which a vessel is reported to have touched, in 1918, and 30 which is assumed to have a depth of about 6½ fathoms (11^m9), lies about 1½ miles offshore 6 miles north-north-eastward of Cabo de Oropesa.

From Capicorp the coast trends about 11 miles north-north-eastward to Peñiscola, and within it the land rises steeply to the summits of 35 Sierra San Benet. Along this stretch of coast there are a few sandy beaches and the mouths of numerous streams, but the greater part of it is rocky.

Cabo de Irta lies about 7 miles north-north-eastward of Capicorp, and about 1½ miles farther in that direction is Torre Almudún. 40

Chart 1187, plan of Peñiscola road.

Peñiscola.—Light.—This small, rocky, fortified peninsula is 210 feet (64^m0) high, and on its summit is a large, square, ancient, and prominent castle.

A light is exhibited, at an elevation of 180 feet (54^m9), from a yellow 45 octagonal tower with a dwelling, 33 feet (10^m1) in height, situated in the Papa Luna battery of the castle.

Puerto de Peñiscola lies south-westward of the peninsula, but is suitable for vessels of light draught only.

The harbour is protected by a mole extending about 3 cables south- 50 westward from Bufador battery.

A light is exhibited, at an elevation of 39 feet (11^m9), from a metal structure situated on the head of the mole.

Charts 1187, 2158a.

Chart 1187, plan of Peñíscola road.

From Punta del Huerto, about 4 cables westward of Bufador battery, a small mole extends about three-quarters of a cable south-eastward.

- 5 Pilots are available; but pilotage, *see* page 20, is not compulsory.

Anchorage.—Anchorage can be obtained, in a depth of about $6\frac{1}{2}$ fathoms (11^m9), fine sand, about $3\frac{1}{2}$ cables eastward of the peninsula, but it is completely exposed to onshore winds.

Life-saving.—A lifeboat is stationed at Peñíscola; *see* page 15.

10 *Chart 1320.*

Coast.—From Peñíscola, a sandy beach, with no off-lying dangers, extends about $3\frac{1}{2}$ miles north-north-eastward to Benicarló.

- Benicarló.—Dangers.—Lights.**—This town possesses a small artificial harbour, which is liable to silting, and should not be entered
15 without local knowledge. A pilot is available, but pilotage, *see* page 20, is not compulsory. A considerable quantity of wine is exported.

Dique del Sur (*Lat.* $40^{\circ} 25' N.$, *Long.* $0^{\circ} 26' E.$) extends about $1\frac{1}{2}$ cables east-north-eastward from the coast near the southern end of the town.

- 20 Dique de Levante extends about $3\frac{1}{2}$ cables southward from the coast near the northern end of the town.

The entrance of the harbour, which faces southward, is about 400 feet (121^m9) wide.

- A light is exhibited, at an elevation of 39 feet (11^m9), from a black,
25 metal tower, 25 feet (7^m6) in height, situated on the head of Dique de Levante.

A light is exhibited, at an elevation of 30 feet (9^m1), from a black, metal tower, 25 feet (7^m6) in height, situated on the head of Dique del Sur.

- 30 Piedras de la Fuerza, with depths of $2\frac{3}{4}$ fathoms (5^m0), lie about $3\frac{1}{2}$ cables offshore 8 cables southward of the entrance to the harbour.

Piedras de la Barbada, with depths of from $3\frac{1}{4}$ to 5 fathoms (6^m9 to 9^m1), lie about 2 cables east-north-eastward of the head of Dique de Levante.

- 35 **Anchorage.**—Anchorage, exposed to onshore winds, can be obtained off Benicarló, in depths of 5 or 6 fathoms (9^m1 or 11^m0), about three-quarters of a mile offshore, with the tower of the church in the town bearing between 304° and 325° .

- Coast.**—From Benicarló the coast trends about 3 miles north-
40 north-eastward to the town of Vinaroz. It is low, with rocky patches alternating with sandy beaches, and rises gently inland.

Chart 1187, plan of Vinaroz.

- Puerto de Vinaroz. — Lights. — Buoy.** — This harbour is protected by two moles. Dique de Levante extends about 5 cables south-
45 ward from the coast near the southern end of the town. Dique de Poniente extends about $2\frac{1}{2}$ cables south-eastward and eastward from the coast near the bull-ring.

- The entrance to the harbour faces southward and is about one cable wide. From the middle of Dique de Levante a transverse mole
50 extends about one cable west-south-westward. In 1949, works were in progress to extend Dique de Levante about one cable south-westward, and to construct a wharf for fishing vessels near the head of the harbour. A black buoy is moored about 65 yards (59^m4) seaward of the extension of Dique de Levante.

Charts 1187, 2158a.

Chart 1187, plan of Vinaroz.

A light (*Lat. 40° 28' N., Long. 0° 29' E.*) is exhibited, at an elevation of 37 feet (11^m3), from a grey, iron column on a stone base, 30 feet (9^m1) in height, situated on the original head of Dique de Levante.

A light is exhibited, at an elevation of 23 feet (7^m0), from the head of the extension of Dique de Levante, and is moved as the work progresses. A vessel entering should give this light a berth, of about 130 yards (118^m9), to avoid the submerged part of the extension works.

A light is exhibited, at an elevation of 35 feet (10^m7), from an iron column, 20 feet (6^m1) in height, situated on the head of Dique de Poniente.

A light is exhibited, at an elevation of 26 feet (7^m9), from the head of the transverse mole.

There are depths of from 7 to 29 feet (2^m1 to 8^m8) in the harbour. Along the inner part of Dique de Levante and the transverse mole there are depths of from 7 to 19 feet (2^m1 to 5^m8). The western part of the harbour is shallow.

Pilotage, *see* page 20, is compulsory.

Danger.—Light-buoy.—Rompeolas de Levante, a patch of stones and sand, lies about 1½ cables south-south-eastward of Dique de Poniente light column. It is marked by a can light buoy, painted red and exhibiting a *green fixed* light.

Anchorage.—The best berth for vessels anchoring off the harbour is in depths of from 3½ to 5 fathoms (6^m9 to 9^m1), with the light-structure at the head of Dique de Levante in line with that at the head of the transverse mole, bearing about 325°. *See* chart 1320.

Port facilities.—Provisions and water can be procured. Stocks of coal and diesel oil are maintained. Minor repairs can be executed.

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at Vinaroz. *See* page 15.

Coast.—From Vinaroz, the coast trends about 4 miles north-north-eastward to Casa del Sol del Riú, and is free from off-lying dangers. In it are the mouths of several streams, the largest and southernmost being Rio Cérvol, close northward of Puerto de Vinaroz.

Chart 1571, plan of Puerto de los Alfaques.

Casa del Sol del Riú stands near the coast on the southern side of the mouth of Rio Cenía, and is a white building above which rises a battlemented turret.

Rio Cenía flows continually, though there is usually but little water in it. At its mouth is a bar, and vessels should not approach within half a mile of the coast.

Casas de Alcanar are situated on the coast, at the northern end of the beach of the same name, about 2 miles north-north-eastward of Casa del Sol del Riú, and northward of them the land rises steeply to Sierra del Montsiá.

Sierra del Montsiá dominates this stretch of coast and possesses several prominent peaks. Pare Pascual, 2,506 feet (763^m8) high, is situated about 3½ miles northward of Casas de Alcanar; El Baul, 2,493 feet (759^m9) high, lies about one quarter of a mile farther north-north-eastward; La Quebrada, 2,378 feet (725^m0) high, is situated about three-quarters of a mile north-north-eastward of El Baul; and La Horadada, 2,290 feet (698^m0) high, lies about 3 cables north-eastward of La Quebrada.

Peña del Bel (*Lat. 40° 37' N., Long. 0° 10' E.*), *see* chart 1320, attains

Charts 1320, 1187, 2158a.

Chart 1571, plan of Puerto de los Alfaques.

an elevation of 3,293 feet (1,003^m7) about 16 miles west-north-westward of Vinaroz, and is a good distant landmark.

At the foot of Sierra del Montsiá, the coast between Casas de Alcanar and San Carlos de la Rápita, about 5 miles north-eastward, consists of a series of small cliffs alternating with short beaches.

Chart 1187.

ALFAQUES DE TORTOSA.—Alfaques de Tortosa, or the delta of Rio Ebro, is subject to extensive flooding; it is low and unhealthy, and is covered for its major part with marshes, stagnant pools, and salt pans connected by shallow creeks and canals, thus forming an immense number of islands, the whole projecting eastward for about 12 miles from an imaginary line joining San Carlos de la Rápita and Punta Figuera, about 14 miles north-north-eastward, *see* page 130. The south-eastern and north-eastern coasts of the delta are gradually extending seaward, the alluvium first forming shoals and islets, which, subsequently becoming connected with the land, form small harbours, and finally lagoons or salt pans. Of such harbours are Puerto de los Alfaques and Puerto del Fangar on the southern and northern sides, respectively, of the delta (*Lat.* 40° 40' N., *Long.* 0° 40' E.).

Rio Ebro is one of the largest rivers in Spain, but, owing to a shallow bar and many shifting shoals at its mouth, it can only be entered by vessels of light draught. Pilotage is essential, and pilots can be obtained from the village of Barracas, *see* pages 20 and 130.

Tortosa, which had a population of about 20,000, in 1946, is situated on the left bank of Rio Ebro about 12 miles northward of San Carlos de la Rápita, and 25 miles from the mouth of the river.

Chart 1571, plan of Puerto de los Alfaques.

Puerto de los Alfaques.—**Lights.**—This harbour, in which the depths do not exceed 3½ fathoms (6^m4), is entered between Punta de la Senieta, about three-quarters of a mile south-westward of San Carlos de la Rápita, and Punta del Galacho, about 1½ miles south-eastward. The depths within about half a mile of the northern and southern sides of the harbour and within one mile of its head are shallow; the southern side of the harbour is formed by a low peninsula, *see* page 129.

Punta del Galacho, at the north-western end of the peninsula, is very low and is gradually extending westward.

The harbour, the depths all over which are continually decreasing, affords shelter to vessels drawing not more than 20 feet (6^m1) from 2 to 4 miles within its entrance, the bottom being of soft mud. North-westerly squalls descending from Sierra del Montsiá frequently cause vessels to drag, and north-easterly gales raise a choppy sea. North-easterly and south-easterly winds raise the level of the sea, and those from the other quarters lower it. On the southern side of the harbour, about 3½ miles eastward of Punta del Galacho, is a long iron pier extending northward from Salinas de la Trinidad.

At the southern end of the town of San Carlos de la Rápita, there is a small fishing harbour protected on its southern side by a mole about 2 cables in length, and on its northern side by a short breakwater; in 1946, there was a dredged depth of about 10 feet (3^m1) inside this harbour. A breakwater is under construction and extends south-eastward from a position close southward of the root of the fishing

Chart 1571, plan of Puerto de los Alfaques.

harbour mole. In 1950, the completed portion of this breakwater was about $1\frac{1}{2}$ cables long.

San Carlos de la Rápita light is exhibited, at an elevation of 32 feet (9^m8), from a white circular tower, 23 feet (7^m0) in height, situated on Punta de la Senieta. *See view facing page 125.* 5

A light (*Lat. 40° 37' N., Long. 0° 36' E.*) is exhibited, at an elevation of 16 feet (4^m9), from the head of the fishing-harbour mole.

A light is exhibited, at an elevation of 15 feet (4^m6), from a wooden post, 7 feet (2^m1) in height, situated on the breakwater, which, in 1946, was under construction close southward of the fishing-harbour mole. 10

Town.—Port facilities.—The town of San Carlos de la Rápita, which, in 1946, had a population of about 7,000, stands on the northern shore of Puerto de los Alfaques, at the foot of Cerro de la Guardiola, which hill attains an elevation of 380 feet (115^m8), and has a tower on its summit. In the town are a number of large buildings and a prominent church. A landing mole extends abreast the town, but about $1\frac{1}{2}$ cables from it lies a shifting sandbank, which prevents access without local knowledge. 20

Directions.—Anchorage.—A vessel approaching from southward should follow the coast northward from Vinaroz, *see chart 1320*, about one mile offshore. A vessel approaching from eastward should exercise the greatest caution, *see below.*

In thick weather no attempt should be made to enter the port unless circumstances render it absolutely necessary. 25

The best berth is, in depths of about $3\frac{1}{2}$ fathoms (6^m4), with the tower on Cerro de la Guardiola bearing 302°, distant about $2\frac{1}{2}$ miles; here the vessel will be sheltered from south-westerly seas, and will not be affected by squalls from Sierra del Montsiá. 30

Temporary anchorage can be obtained on an imaginary line joining Cerro de la Guardia and Punta del Galacho. 30

Coast.—Caution.—Lights.—From Punta del Galacho the coast trends about $1\frac{1}{2}$ miles southward to Punta Corballera, and thence about $2\frac{1}{2}$ miles eastward to Punta de la Baña. 35

Caution must be exercised when in the vicinity of this stretch of coast for it is extending considerably both westward and southward. In 1917 two vessels, and in 1918 one vessel, were reported to have grounded or struck obstructions from $1\frac{1}{2}$ to $2\frac{1}{2}$ miles offshore.

A light is exhibited, at an elevation of 29 feet (8^m8), from a grey, metal tower, on a concrete base, situated on Punta Corballera. 40

A light is exhibited, at an elevation of 59 feet (18^m0), from a grey, conical, iron tower, 56 feet (17^m1) in height, situated on Punta de la Baña. *See view facing page 125.*

Playa del Trabucador is a narrow isthmus of sand and mud connecting the low swampy peninsula on the southern side of Puerto de los Alfaques with the remainder of the delta of the Ebro farther north-eastward. It should be given a wide berth for it is extending seaward, and the depths off it are shoal. 45

Charts 1320, 310. 50

Cabo de Tortosa, about 15 miles north-eastward of Punta de la Baña, is the southern entrance point of the principal mouth of Rio Ebro and the eastern extremity of Isla de Buda.

Isla de Buda is very low and at times submerged in places; it was

Charts 1187, 2158a.

Charts 1320, 310.

separated from the rest of the delta by the southern mouth of the river, but this latter has silted up.

- 5 A light is exhibited, at an elevation of 169 feet (51^m5), from a grey, circular, iron tower, 169 feet (51^m5) in height, situated about three-quarters of a cable westward of Cabo de Tortosa (*Lat.* 40° 43' N., *Long.* 0° 54' E.).

Shoals, formed by the alluvium of Rio Ebro, are continually extending off the entrance of the river, and Cabo de Tortosa lighthouse should 10 not be approached within 2 miles. Special caution is necessary at night and in thick weather. North-easterly winds give rise to a current setting into the bight northward of the cape.

Barracas is a fishing village, on the northern bank of Rio Ebro, about one mile westward of the lighthouse.

- 15 From the northern entrance point of the principal mouth of Rio Ebro, the north-eastern coast of the delta trends about 7½ miles north-westward to Punta del Fango; it should be given a wide berth, for depths of 6 fathoms (11^m0) and less are found within 2½ miles of it in places.

20 *Chart 1458, plan of Puerto del Fangar.*

- Golfo de la Ampolla.—Light.**—This bay, on the north-eastern side of Alfaques de Tortosa, is entered between Punta del Fango and Cabo Roig, about 2 miles north-north-westward. On the north-western side of the head of the bay is Fondeadero de la Ampolla, and 25 on the southern side is Fondeadero del Fangar.

Punta del Fango is the western extremity of a low peninsula which is extending westward across the entrance of the bay.

- A light is exhibited, at an elevation of 25 feet (7^m6), from a grey, iron tower, 23 feet (7^m0) in height, situated about one mile eastward 30 of Punta del Fango. See view facing page 125.

Punta Figuera, see page 128, lies about half a mile north-eastward of Cabo Roig, and from the latter, which is about 20 feet (6^m1) high and may be identified by a reddish scar on it, the shore on the north-western side of the bay trends about 1½ miles south-westward, and 35 thence south-eastward and eastward. The first part of this coast is steep, rugged, and indented, whereas the second is part of the delta of Rio Ebro.

- La Ampolla is a fishing village and bathing resort, about one mile south-westward of Cabo Roig. Pilots are available, but pilotage, see 40 page 20, is not compulsory.

Anchorage.—Anchorage may be taken in Fondeadero de la Ampolla in depths of about 3½ fathoms (5^m9), mud and sand, with Cabo Roig bearing 049° and Punta del Fango lighthouse bearing 111°, but it is exposed north-eastward and eastward. North-westerly winds lower 45 the level of the sea and south-easterly winds raise it by about one and 2 feet (0^m3 and 0^m6), respectively, but neither wind is dangerous.

- Fondeadero del Fangar affords shelter from all winds, to vessels drawing less than 13 feet (4^m0), about 14 cables south-westward of Punta del Fango light-tower. In summer larger vessels can anchor 50 in depths of 2½ or 3½ fathoms (5^m0 or 5^m9), westward of Punta del Fango.

Caution must be exercised when approaching either anchorage in Fondeadero del Fango, as Punta del Fango is extending and is now considerably westward of its charted position.

Charts 1187, 2158a.

Chart 310.

COAST.—Golfo de San Jorge.—Lights.—This bight is entered between Cabo de Tortosa and Cabo de Salou, about 23 miles north-eastward. On its south-western side is the delta of Rio Ebro, and within its head Sierra de Balaguer rises to elevations of over 2,000 feet (809^{m6}). Between Fondateiro de la Ampolla and Rada de Salou, *see* page 132, the bay affords no anchorage, for though there are no off-lying dangers, the bottom is in most places of rock and gravel. 5

Punta del Aguila (*Lat.* 40° 51' N., *Long.* 0° 46' E.) lies about 2 miles north-north-eastward of Punta Figuera, and close southward of it is an islet. 10

Coll de los Guardias rises to an elevation of 807 feet (246^{m0}) about 2½ miles north-westward of Punta del Aguila, and on it is a tower.

El Estany Gras, about 2 miles north-north-eastward of Punta del Aguila, is a cove frequented by local fishing craft. 15

A light is exhibited, at an elevation of 41 feet (12^{m5}), from a masonry tower, 20 feet (6^{m1}) in height, situated at El Estany Gras.

Cala de la Ametlla (Atmella), about three-quarters of a mile north-eastward of El Estany Gras, is used by fishermen. Pilots are available, but pilotage, *see* page 20, is not compulsory. 20

A light is exhibited, at an elevation of 34 feet (10^{m4}), from a metal post, 17 feet (5^{m2}) in height, situated on the head of the breakwater, which is under construction at Cala de la Ametlla. This light is moved as the work progresses.

Cabo de San Jorge is about 2½ miles north-north-eastward of Cala de la Ametlla, and between them are numerous coves. The cape may be identified by a ruined fort on its summit, with a coastguard hut near it. 25

Los Frailes are three conspicuous peaks, attaining an elevation of 1,542 feet (470^{m0}), about 3 miles north-westward of Cabo de San Jorge. 30

Cabo del Termino lies about 2 miles north-eastward of Cabo de San Jorge, and off it is a tunny fishery, *see* page 27.

Coll de Balaguer, about 1½ miles north-eastward of Cabo del Termino, is a small hill, situated near the coast, which can be identified by the whiteness of an embankment carrying the coastal road, and by the ruins of Castillo de San Felipe near it. 35

La Mamelleta, a peak in Sierra de Balaguer, attains an elevation of 2,339 feet (712^{m9}) about 3 miles westward of Castillo de San Felipe.

Punta de Oca and Punta de Riu de Llastres lie, respectively, about 3½ and 4½ miles north-eastward of Cabo del Termino. Punta de Riu de Llastres is low and somewhat salient, with Torre del Hospitalet and a coastguard hut on it; there is a large and conspicuous ruined convent near the tower. 40

Punta dels Peñals lies about 1½ miles north-eastward of Punta de Riu de Llastres, and about half a mile farther north-eastward is a prominent ruin with a coastguard hut close westward of it. At a short distance farther north-eastward is Punta de la Porquerola, near which is a tower. 45

Sierra de Llavèria, about 6 miles north-westward of Punta de la Porquerola, has two summits, respectively, 3,022 and 2,999 feet (921^{m1} and 914^{m1}) high; on the former is a pillar, and on the latter a tower. 50

Punta de la Pixerota, with a conspicuous coastguard hut on it,

Charts 1187, 2158a.

Chart 310.

and Punta del Riudecañas are, respectively, about $1\frac{1}{2}$ and $2\frac{1}{2}$ miles north-eastward of Punta de la Porquerola.

- Puerto de Cambrils.—Lights.**—The town of Cambrils is situated half a mile inland, nearly midway between Punta del Riudecañas and Punta de la Riera de Riudoms (*Lat.* $41^{\circ} 04' N.$, *Long.* $1^{\circ} 05' E.$), about 3 miles east-north-eastward.

In 1949, an artificial harbour was under construction. The western mole extends about $2\frac{1}{2}$ cables south-eastward and east-south-eastward from the coast. The eastern mole extends about $2\frac{3}{4}$ cables southward and south-westward. The entrance, when the works are completed, will be about half a cable wide.

In 1950 the depths in the harbour varied from about 19 feet (5^m8) in the entrance to 10 feet (3^m0) and less inside.

- 15 Pilots are available; but pilotage, *see* page 20, is not compulsory.

A light is exhibited from a wooden post situated on the head of the western mole. This light is moved as the work progresses.

A light is exhibited, at an elevation of 15 feet (4^m6), from an iron post, 9 feet (2^m7) in height, at the head of the eastern mole.

- 20 On the slopes north-westward of the town may be seen the hermitage of San Ramón, and the steeples of the churches in Botarell, Montbrió, and Viñols.

Chart 1458, plan of Rada de Salou.

- Rada de Salou.**—This roadstead lies off the coast between Punta de la Riera de Riudoms and Cabo de Salou, about 4 miles eastward.

- Punta de la Riera de Riudoms, close eastward of which is Punta del Esquirol with a tower on it, is a low sandy point at the mouth of a small stream, which latter, though dry in summer, inundates the neighbourhood in winter. From Punta de la Riera de Riudoms, a sandy beach, backed by pine groves, extends about $2\frac{1}{2}$ miles east-north-eastward to Salou.

Salou is a village at which there is a small landing mole.

- Punta Pedrera lies about half a mile east-south-eastward of the mole at Salou, and from it the coast trends south-eastward towards Cabo de Salou, becoming high and indented, with beaches at the heads of the coves.

Punta del Lazareto is close south-eastward of Punta de la Pedrera, and between them, at an elevation of 95 feet (29^m0), stands Torre Nueva.

- 40 Punta del Porroc lies about 2 cables southward of Punta Lazaretto.

Punta Grosa lies about $1\frac{1}{2}$ miles south-eastward of Punta del Porroc.

Cala del Cranc is entered between Punta Grosa and Cabo de Salou, about three-quarters of a mile eastward. A rock, with a depth of less than 6 feet (1^m8), lies in the entrance to the harbour.

- 45 **Anchorage.**—Rada de Salou affords anchorage, sheltered from winds from north-west, through north, to east, in depths of from $5\frac{1}{2}$ to $6\frac{1}{2}$ fathoms (10^m1 to 11^m9), good holding ground of sand and weed, about 3 cables southward of the mole; small vessels can anchor closer inshore. At all times, especially in winter, vessels should be prepared to put to sea on any indication of a southerly wind.

Cabo de Salou.—Light.—This cape is the southern extremity of a rocky promontory, yellowish in places, which rises to an elevation of 259 feet (78^m9), and at a distance appears as an island, on account of the low land within it. *See* view facing page 136.

Charts 1187, 2158a.

Chart 1458, plan of Rada de Salou.

A light is exhibited, at an elevation of 140 feet (42^m7), from a white tower surmounting a building, 36 feet (11^m0) in height, situated on Cabo de Salou (*Lat.* 41° 03' N., *Long.* 1° 10' E.).

Rincón de Salou.—From Cabo de Salou, the coast continues high and rocky for about three-quarters of a mile north-eastward to Punta del Rincón. 5

Playa del Rincón de Salou extends about half a mile north-eastward from Punta del Rincón. It is a sandy beach, off which the depths are less than 3 fathoms (5^m5) at a distance of about 2 cables. 10

Casa Botigas stands at the northern end of Playa del Rincón de Salou, and north-eastward of it the coast is stony.

Anchorage.—Anchorage, sheltered from north-westerly winds, can be obtained, in depths of from 4½ to 5½ fathoms (7^m8 to 10^m1), fine sand, about 3 cables off Playa del Rincón de Salou. 15

Chart 344.

PUERTO DE TARRAGONA.—**Lights.**—This harbour lies about 4 miles north-eastward of Cabo de Salou, *see* chart 310, and the coast between the northern end of Playa del Rincón and the mouth of Rio Francoli, on the western side of the port, is low and mostly sandy; 20 at the eastern end of this stretch of coast are Playa de la Canonja and Playa de Riu Cla.

Dique del Oeste extends from the eastern side of the mouth of Rio Francoli south-westward and westward, parallel with the coast, for about 3½ cables; from its head a submerged mole extends about 25 2½ cables farther westward.

The harbour is partially protected from westward by Dique de Abrigo, which extends about 2½ cables southward into the outer harbour from Dique de Oeste.

Muelle de Levante protects the harbour on its eastern side, and 30 extends about one mile southward, south-westward and westward from the coast abreast the city.

The pilot station, health office and lifeboat house are situated within 3 cables of the head of Muelle de Levante; near the root of this mole stands a prominent clock tower and the custom house. 35

The harbour is divided into two parts by transverse moles extending from either breakwater, the entrance of the inner harbour, between their heads, being about one cable wide.

A light is exhibited, at an elevation of 66 feet (20^m1), from a stone tower with a dwelling, 52 feet (15^m8) in height, situated on the head 40 of Muelle de Levante.

A light is exhibited, at an elevation of 42 feet (12^m8), from a masonry tower, 33 feet (10^m1) in height, situated on the head of Dique de Abrigo.

A light is exhibited, at an elevation of 26 feet (7^m9), from a davit, 45 20 feet (6^m1) in height, situated on the head of the western transverse mole.

A light is exhibited, at an elevation of 26 feet (7^m9), from a davit, 20 feet in height, situated on the head of the eastern transverse mole.

The outer harbour, within an area indicated by pecked lines on 50 the chart, was dredged to a depth of 33 feet (10^m1), in 1945. A 29-foot (8^m8) patch of foul ground is situated on the northern side of the dredged area, about 1½ cables north-north-westward of the head of Muelle de Levante.

Charts 1187, 2158a.

Chart 344.

Vessels lie at anchor, in depths of from 27 to 30 feet (8^m2 to 9^m1), with their sterns secured to bollards on Muelle de Levante, or may go alongside the southern side of the eastern transverse mole, where there
5 are depths of about 30 feet (9^m1).

Caution should be exercised when securing the stern to Muelle de Levante, because the slope of the rubble base of the mole is such that there is a depth of only 10 feet (3^m0) about 20 yards (18^m3) from the mole (*Lat. 41° 06' N., Long. 1° 14' E.*).

10 The inner harbour is extensively quayed, and a slipway and shipyard are situated on the western side; hauling-off buoys are moored off the quays. The general depths are from 23 to 31 feet (7^m0 to 9^m5), the eastern part of the harbour being the deeper.

Pilotage, *see* page 20, is compulsory.

15 **Directions.—Anchorage.**—The outer harbour is open south-westward, but affords excellent protection from easterly winds.

A vessel should experience no difficulty in making the port; but when entering and berthing, caution is necessary, for at times a considerable current and strong eddies are experienced off the mole heads,
20 and there is little room for manœuvring. Entry should not be attempted if a heavy sea is running.

Anchorage can be obtained, with offshore winds, in depths of from 9 to 14 fathoms (16^m5 to 25^m6), sand and weed, between the meridian of the head of Muelle de Levante and that of Punta Gorda, about
25 1½ miles north-eastward; but care must be taken to avoid the rocky patches covered with sand, named del Sagrista, Los Carbunclos, and del Pastor, lying, respectively, within 1½ and 2½ cables of the mole and 3 cables of Punta Gorda. A good berth is in the area bounded eastward by the alignment of the tower of the cathedral with the eastern
30 extremity of Fuerte de Toro, bearing 010°, and westward by the alignment of Fuerte de Toro with the south-eastern side of Muelle de Levante, bearing about 036°.

City.—Port facilities.—Communications.—Tarragona is the capital of the province of the same name, and had, in 1947, a population
35 of about 38,000. It stands at the foot and on the side of a hill, 360 feet (109^m7) high, which slopes steeply on its seaward side.

In the old part of the city, near the summit of the hill, are numerous large buildings, and the remains of ancient fortifications.

A stock of coal is maintained. Provisions can be procured. Water
40 is laid on to the quays or can be supplied in tank vessels. The slipway in the inner harbour can accommodate vessels up to 300 tons. Minor repairs can be executed. There are cranes up to 5 tons capacity, and a floating sheer legs of 30 tons capacity. The wharves are connected with the railway system.

45 For deratisation, *see* page 22.

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at Tarragona. *See* page 15.

Chart 310.

COAST.—Danger.—From Puerto de Tarragona the coast trends
50 about 7 miles eastward to Cabo Gros, and consists of exposed sandy beaches separated by rocky points.

Punta del Tamarit lies about 1½ miles westward of Cabo Gros, and on it is the village of Tamarit.

Charts 1187, 2158a.

Chart 310.

Altafulla and Torredembarra are two small towns, situated close north-westward and northward, respectively, of Cabo Gros.

Pilots are available at both Altafulla and Torredembarra, but pilotage, *see* page 20, is not compulsory. 5

From Cabo Gros, the coast trends about 16 miles east-north-eastward to Villanueva y Geltrú, and consists of a beach with a shoal bank extending from it for a short distance. In bad weather, the sea breaks over a rocky bottom at some distance offshore. Near this stretch of coast are numerous fishing villages, and behind them the land rises 10 gradually to lofty mountains.

There are several towers and coastguard huts on this part of the coast, and close westward of Punta Palomera, about $4\frac{1}{2}$ miles east-north-eastward of Cabo Gros, is the hermitage of Bará (*Lat.* $41^{\circ} 08' N.$, *Long.* $1^{\circ} 24' E.$), on a hill 213 feet (64^m9) high. 15

Vendrell is a town situated about 2 miles inland and $3\frac{1}{2}$ miles north-eastward of Punta Palomera.

Punta Madrigueras lies about $3\frac{1}{2}$ miles eastward of Punta Palomera, and about 6 cables southward of it lies a detached $2\frac{1}{2}$ -fathom (4^m6) patch. 20

Punta de San Pedro and Punta de San Gervasio are, respectively, about $2\frac{1}{2}$ miles and one mile westward of Villanueva y Geltrú; the first is at the mouth of Rio Foix, and about half a mile inland of it is the town of Cubellas, with a high belfry; the second is rocky and about one-quarter of a mile north-eastward of it is a hermitage on the 25 summit of a hill.

Life-saving.—A lifeboat is stationed at Torredembarra and at the village of Calafell about 4 miles east-north-eastward of Punta Palomera. *See* page 15.

Villanueva y Geltrú.—**Lights.**—Villanueva y Geltrú stands on 30 the western bank near the mouth of Torrente del Esteny (Pastera). The high steeples of the churches and the tall chimneys of the factories show up well from seaward.

A mole is under construction at the mouth of Torrente del Esteny, from the head of which a light is exhibited; this light is moved as the 35 work progresses.

A light is exhibited, at an elevation of 89 feet (27^m1), from a stone tower, in the form of a truncated cone with a white dwelling attached, 69 feet (21^m0) in height, situated on Punta de San Cristóbal, the rocky western entrance point of Torrente del Esteny; close north-eastward 40 of the point is a hermitage.

Anchorage.—Anchorage, during north-westerly winds only, can be obtained between Puntas de San Gervasio and de San Cristóbal, in a depth of 4 fathoms (7^m3), about half a mile offshore.

Life-saving.—Two lifeboats are maintained at Villanueva y 45 Geltrú; *see* page 15.

Coast.—From Punta de San Cristobal, the coast, of moderate elevation and somewhat indented, trends about $2\frac{1}{2}$ miles eastward to the western end of Playa de Sitges; close off the western end of this beach are two rocky patches. 50

El Mantafazo is a small, detached, 10-fathom (18^m3) patch, about 3 miles southward of Punta de San Cristóbal.

Playa de Sitges extends about $1\frac{1}{2}$ miles north-eastward, and at its eastern end, on a rocky point, stands the town of Sitges (*Lat.* $41^{\circ} 14' E.$,

Chart 310.

Long. 1° 48' E.). A shoal, rocky patch lies within one cable of the coast near the middle of Playa de Sitges. Sitges has a prominent church standing on a high rampart washed by the sea.

- 5 Eastward of Sitges, the coast, which becomes high, rugged, and somewhat indented, trends about 7 miles eastward to the western end of Playa de Vallbona.

Cala de Aguadulce lies about three-quarters of a mile, and Cala Vallcarca about $1\frac{1}{2}$ miles, eastward of Sitges.

- 10 Puerto de Vallcarca is protected by a mole which extends about $2\frac{1}{2}$ cables south-eastward and south-south-westward from the coast. This harbour is privately maintained. Pilots are available, but pilotage, *see* page 20, is not compulsory. Some cement works close to the harbour are prominent, and the hermitage of La Trinidad, standing on
15 a 620-foot (189^m0) hill, dominates the cove.

Puerto de Garraf is a cove protected by a mole about $3\frac{1}{2}$ miles eastward of Cala de Aguadulce, but it has been abandoned and has silted up.

- Castell de Fells stands at an elevation of 230 feet (70^m1), about one
20 mile inland of the western end of Playa de Vallbona.

Playa de Vallbona extends about $9\frac{1}{2}$ miles eastward and north-eastward to the mouth of Rio Llobregat, and within it is Llano de Llobregat. This plain has been formed by the alluvium of the river, and in it are numerous shallow lagoons with openings to the sea.

- 25 Except off the mouth of the river, the beach is free from off-lying dangers, but it should be given a wide berth for the sea breaks heavily on it and there is an appreciable set towards it; sounding should be continuous.

- Anchorage.**—Anchorage, protected only from offshore winds, can
30 be obtained off Sitges, in a depth of $5\frac{1}{2}$ or $6\frac{1}{2}$ fathoms (10^m1 or 11^m9), good holding ground of fine sand, with the church bearing about 011°, distant about 6 cables.

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at Sitges. *See* page 15.

- 35 **BARCELONA.—Approach.—Aspect.**—Montaña de Montserrat with its bare conical peaks forms an unmistakable distant mark when approaching Barcelona. It rises about 21 miles north-north-westward of Castell de Fells, and its highest summit, Pico de San Jerónimo, attains an elevation of 4,052 feet (1,235^m0); *see* views facing page 136. Mon-
40 taña de Montseny, *see* page 141, is also easily identified.

- El Tibidabo, San Pedro Martir, and San Justo are the highest summits of a range of mountains which dominates the city on its north-western side; El Tibidabo is 1,703 feet (519^m1) high, and on its summit is a tall tower; in the pass between El Tibidabo and
45 San Pedro Martir is the town of Valvidrera; and on the summit of San Pedro Martir are some ruins.

Chart 1195 and plan.

- Two steel framework masts, 377 and 262 feet (114^m9 and 79^m9) high, respectively, of an aerial railway, are situated on Muelles de
50 Barcelono and Nuevo (*see* below), and are prominent objects to a vessel approaching the port.

From the mouth of Rio Llobregat, Playa del Antunez, on the eastern side of Llano de Llobregat, trends about $2\frac{1}{2}$ miles northward to the

To face page 136.

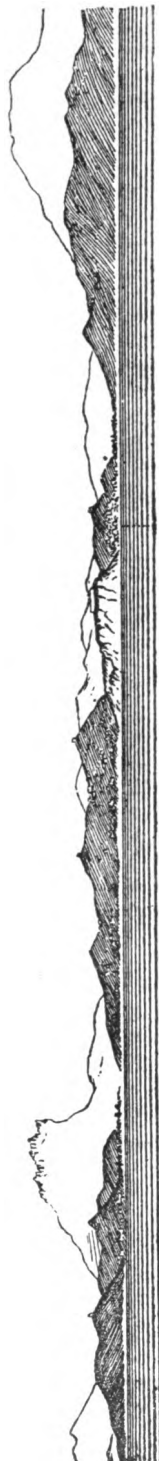


*Punta
Grosa.*

*Cabo de Salou
lighthouse, bearing
340°, about one mile.*

Cabo de Salou from south-south-eastward.

*Castillo de
Montcada.*



*Montaña de
Montserrat.*

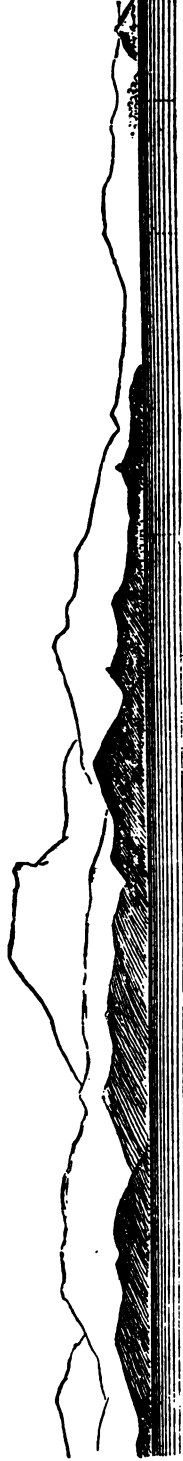
El Tibidabo.

*Castillo
de
Montjuich.*

*Montaña de
Montserrat.*

bearing 346°, 10 miles.

Approach to Barcelona from southward

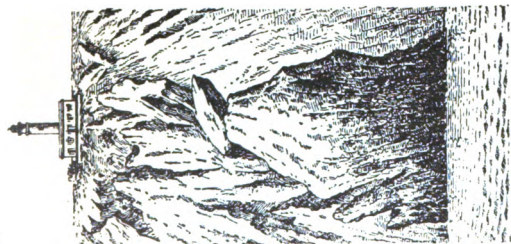


*Montaña de Montseny,
bearing 319°, 25 miles.*

Montaña de Montseny from south-eastward.

Malgrad.

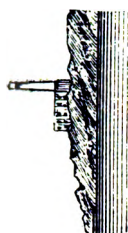
(Originals dated 1893.)



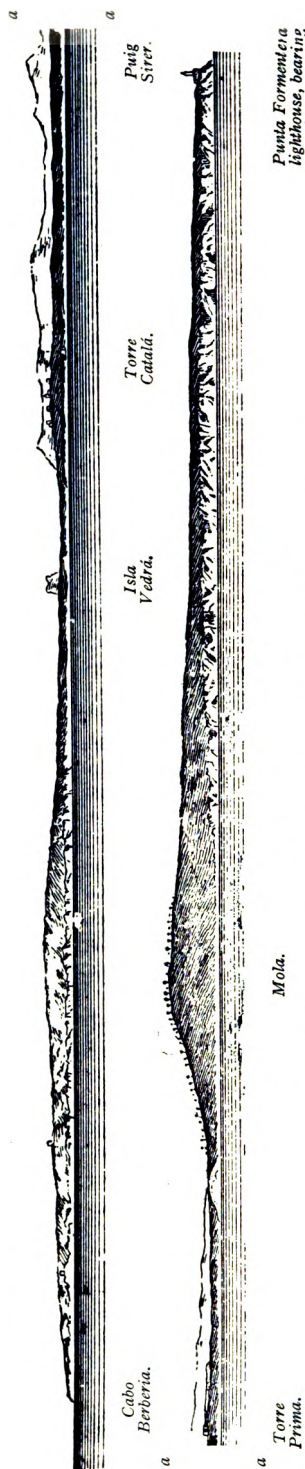
Formentera
lighthouse.
(Original dated
prior to 1937.)



Conejra Grande lighthouse
(Original dated prior to 1937.)



Cabo Favaritz
lighthouse.
(Original dated
prior to 1937.)



View, in two parts, of La Mola from southward.
(Original dated 1917.)

Chart 1195 and plan.

foot of a 679-foot (207^m0) hill, the seaward side of which is faced with reddish cliffs.

Castillo de Montjuich (*Lat.* 41° 22' N., *Long.* 2° 10' E.) stands on the summit of the 679-foot (207^m0) hill; in the castle is a signal station. 5

Light.—Light-buoy.—A light is exhibited, at an elevation of 105 feet (32^m0), from a tower, the upper part octagonal and the lower part square, on a circular building, the whole 102 feet (31^m1) in height, situated near the coast about half a mile northward of the mouth of Rio Llobregat. 10

A light-and-whistle-buoy, painted black and exhibiting a *white flashing light every three seconds*, is moored about 1½ miles south-south-eastward of the above-mentioned lighthouse. It marks the edge of a shifting shoal, with depths less than 5 fathoms (9^m1), off the mouth of Rio Llobregat, and vessels should pass south-eastward of it. 15
In 1946, this shoal had extended south-eastward. The light-and-whistle-buoy is liable to be washed away, and should it be out of position a vessel approaching Barcelona from southward should not alter course northward until the tower of Iglesia del Pino, in the middle of the city, is open eastward of the hill on which stands Castillo de 20 Montjuich, bearing less than 360°.

Harbour.—This extensive artificial harbour has general depths in it from 22 to 52 feet (6^m7 to 15^m8). It is protected on its eastern side by Dique del Este and its extension, and in it are several transverse moles forming five basins. On the eastern side of the harbour are 25 Muelle de Cataluña and Muelle de Baleares, and on its western side are Muelles del Contradique, de Poniente, de Barcelona, and de España. Dársena del Morrot is between Muelle del Contradique and Muelle de Poniente, and at its head is Muelle de Costa. Dársena de San Beltran, with the mole of the same name at its head, is between Muelle 30 de Poniente and Muelle de Barcelona. Darsena Nacional, with Muelles de Atarazanas and de la Muralla on its western side, is westward of Muelle de España, and Darsena del Comercio, with several wharves on its eastern side, is eastward of that mole. Darsena de la 35 Industria, with Muelle Nuevo on its eastern side, is between Muelles de Baleares and de Cataluña, and southward of the last-named are a basin containing a floating dock, *see* page 486, and Muelle de Levante.

Many of the wharves are connected with the railway system, and have cranes on them. At some of the wharves and moles vessels are berthed alongside, but at others they lie at right angles to them with 40 anchors down and their sterns secured to bollards or rings.

The northern side of Muelle del Contradique is reserved for seaplanes, which come down in the area between the northern end of Playa del Antunez and the prolongation of the imaginary line joining the heads of Muelles del Contradique and de Poniente. 45

Flag signals, which may be displayed from the signal station on Muelle del Contradique, are intended for the use of aircraft only.

Muelle de Poniente is the coaling wharf, and is also used by vessels carrying explosives.

Large vessels berth alongside the south-eastern end of Muelle de 50 Barcelona.

The principal landing place is near the Columbus monument close northward of the root of Muelle de Barcelona; but there are landing steps on all the quays at frequent intervals.

Charts 310, 1187, 160, 2158a.

Chart 1195 and plan.

Lights.—A light is exhibited, at an elevation of 354 feet (107^m9), from a small square tower on a two-storied red brick building situated on the south-eastern slope of the hill on which stands Castillo de Montjuich.

A light is exhibited, at an elevation of 106 feet (36^m3), from a grey tower with a white lantern, situated on the head of the extension of Dique del Este.

A light is exhibited, at an elevation of 36 feet (11^m0), from a black wooden mast, 18 feet (5^m5) in height, situated at the head of a short projecting mole near the extremity of the extension of Dique del Este.

Two lights are exhibited, at elevations, respectively, of 20 and 21 feet (6^m1 and 6^m4), one from the southern and the other from the northern corner of the head of Muelle del Contradique, but they are obscured seaward by the extension of Dique del Este.

Other lights are exhibited at the corners of the several projecting moles within the harbour (*Lat.* 41° 22' N., *Long.* 2° 11' E.).

Directions.—**Pilotage.**—Pilotage, *see* page 20, is compulsory. Pilots come out in motor boats and meet incoming vessels off the entrance of the harbour. There are pilot stations at the head of Muelle del Contradique and on Muelle de Barcelona.

A vessel should experience no difficulty in making the harbour, but caution is necessary when approaching from southward, *see* page 137. With strong winds, caution is necessary when berthing, for the manœuvring space is limited; a tug is available. In fine weather, especially in summer, variable currents are experienced in the harbour, which not only incommode a vessel when berthing, but produce considerable alterations in the depths both within the harbour and alongside the wharves. During public holidays, a vessel may anchor southward of Muelle del Contradique, in the lee of the extension of Dique del Este, but the space is limited and during strong onshore winds may be crowded with small sailing vessels seeking shelter.

The roadstead off Barcelona is bad, especially in winter, and very little use is made of it. Anchorage can be obtained by vessels of deep draught about 6 cables eastward of Dique del Este, in depths of from 16 to 19 fathoms (20^m3 to 34^m7), and by smaller vessels closer inshore.

In winter, winds from between north-east and south-east are accompanied by rain, and, if strong, send in a heavy sea. Southerly gales, though not frequent, cause much damage in the road and port; but both are somewhat sheltered, should the wind be westward of south-west. During the winter, the wind is likely to change its direction very suddenly, causing a cross swell and sea at the anchorage, dangerous for boats.

In 1933, H.M.S. *Rodney* anchored about 1½ miles 126° from the watch tower in Castillo de Montjuich.

Prohibited anchorage.—Anchorage is prohibited in an area, the limits of which are indicated by pecked lines on the chart, extending eastward and south-eastward from the coast, east-north-eastward of the head of Darsena del Comercio.

Current.—A current runs parallel with the coast, either northward or southward, but it is much influenced by wind.

City. — **Port facilities.** — **Communications.** — Barcelona is the capital of the province of Barcelona, and has a population of over one

Chart 1195 and plan.

million. British Consular officers reside in the city. There is a seamen's institute.

Supplies of all kinds are abundant. Water is laid on to the quays, or can be supplied in tank vessels. Stocks of coal, fuel oil and diesel oil are maintained. 5

Repairs of all kinds can be effected; for details of floating dock, see page 486. A floating crane of 80 tons capacity is available. Salvage tugs are stationed at Barcelona (*Lat.* 41° 22' N., *Long.* 2° 11' E.). 10

Quarantine regulations are enforced. The quarantine station is on Muelle de Poniente. For deratisation, see page 22.

Harbour regulations are enforced; the office of the Captain of the Port is on Muelle de Barcelona.

Regular steamer communication is maintained with ports in the British isles, Northern Europe, and the Americas; also with most of the important ports in the Mediterranean. 15

Life-saving.—Life-saving appliances are maintained at Barcelona; see page 15.

Climatic table.—See page 50. 20

COAST.—Caution.—From the root of Dique del Este, the coast, which consists of a sandy beach, trends about 3½ miles north-eastward, past the suburbs of Barceloneta, Pueblo Nuevo and El Taulat, to the mouth of Rio Besós; it is fringed by a shoal bank extending 2½ cables offshore in places. 25

Rio Besós is frequently dry, but when in spate it discolours the sea in the vicinity of its mouth for a considerable distance.

Chart 310.

Badalona is a town situated about 1½ miles north-north-eastward of the mouth of Rio Besós and is backed by hills. 30

A concrete mole extends about one cable from the coast, about one-quarter of a mile north-eastward of the mouth of Rio Besós.

Another mole extends about half a cable from the coast about 1½ miles north-eastward of the former mole. This latter mole belongs to a petroleum refinery, and is equipped with pipe-lines. 35

From the north-eastern end of Badalona, the coast trends about 2½ miles north-eastward to Masnou, and on it stands the village of Tiana and numerous detached houses.

Punta de Mongat is close north-eastward of Tiana, and from it a hill rises steeply to an elevation of 226 feet (68^m9); at the summit of the hill are an ancient castle and a tower, and at its foot, on its north-eastern side, is a village which is prominent from seaward. 40

Playa de Mongat, between Punta de Mongat and Masnou, is free from off-lying dangers, except for a stony bank situated about half a cable offshore southward of the castle. 45

Anchorage.—Open anchorage can be obtained off Playa de Mongat, but care must be taken to avoid the above-mentioned bank. Vessels should anchor, about 3 cables offshore, in a depth of 3½ fathoms (6^m9), sand; at a distance of over one mile offshore the holding ground is very good, the bottom being of mud. 50

Chart 1222, plan of Masnou.

Masnou.—Dangers.—Buoy.—This town stands on the coast, and at its western end Rio Alella flows into the sea. Turó de Moná, a hill about three-quarters of a mile inland of the town, rises to an elevation of 574 feet (175^m0). 55

Charts 118 7, 160, 2158a.

Chart 1222, plan of Masnou.

Banco Los Colls, with depths of from $3\frac{1}{2}$ to 5 fathoms (5^m9 to 9^m1), sand, lie parallel with, and from 3 to 6 cables off, the coast on the north-eastern side of Masnou.

- 5 A black can buoy is moored on the southern side of Banco Los Colls, about 8 cables south-eastward of the church at Masnou.

Anchorage.—With offshore winds, anchorage can be obtained, in depths of about 10 fathoms (18^m3), with the church at Masnou in line with Turó de Moná, bearing 351° , about half a mile offshore.

10 *Chart 310.*

Coast.—Dangers.—From the mouth of Rio Alella, the coast trends about $1\frac{1}{2}$ miles east-north-eastward to Premiá de Mar. It is fringed by a narrow, rocky bank, but about one cable offshore the bottom is sand.

- 15 Vilasar de Mar is situated on the coast about $1\frac{1}{2}$ miles north-eastward of Premiá de Mar. The coast in the vicinity of Vilasar de Mar (*Lat. $41^\circ 30' N.$, Long. $2^\circ 24' E.$*) is free from off-lying dangers.

Tunny nets, *see* page 27, are laid out annually off Vilasar de Mar.

- 20 Punta de San Ginés lies about midway between Premiá de Mar and Vilasar de Mar, and between it and the former town is Bajo de la Ballena, an above-water rock lying close inshore.

Riera de Argentona flows into the sea about $1\frac{1}{2}$ miles north-eastward of Vilasar de Mar; it is dry in summer, but when in spate is of considerable size. It may be identified from seaward by the width of its

- 25 valley and the gap in the hills through which it flows.
A rocky bank, with depths of from $1\frac{1}{2}$ to $4\frac{1}{2}$ fathoms (2^m7 to 7^m8), fringes the coast between Vilasar de Mar and the mouth of Riera de Argentona, and extends about $6\frac{1}{2}$ cables from the latter.

- Anchorage.—Caution.**—Open anchorage can be obtained, during
30 offshore winds, off Premiá de Mar, in depths of from $4\frac{1}{2}$ to $5\frac{1}{2}$ fathoms (7^m8 to 10^m1), from 3 to 4 cables offshore.

Anchorage, sheltered from winds from between north-west and north-east, can be obtained off Vilasar de Mar, in depths of $3\frac{3}{4}$ fathoms (6^m9), about one cable offshore.

- 35 Vessels should avoid anchoring off the coast between Vilasar de Mar and the mouth of Riera Argentona.

Chart 1222, plan of Mataró.

- Mataró.—Dangers.—Buoy.**—This town is situated on the coast about $1\frac{1}{2}$ miles north-eastward of the mouth of Riera Argentona, *see*
40 *chart 310*; close north-eastward of it is the mouth of Riera de San Simón (*Lat. $41^\circ 32' N.$, Long. $2^\circ 27' E.$*), which latter river is dry in summer.

- Niñ Armat Pequeño, Niñ Armat Grande and La Matella are three detached, rocky shoals, with depths of from $3\frac{1}{2}$ to $5\frac{1}{2}$ fathoms (5^m9
45 to 9^m6), lying within three-quarters of a mile of the coast, 12 cables south-south-westward, $8\frac{1}{2}$ cables southward and 7 cables south-eastward, respectively, of the mouth of Rio de San Simón.

- A conical buoy, painted black and white in horizontal bands, is moored close south-eastward of the shoalest part of Niñ Armat Grande,
50 about one mile south-south-eastward of Mataró church.

Roca de la Torre, with a depth of $3\frac{1}{2}$ fathoms (5^m9), lies about one cable offshore south-south-eastward of Mataró church.

Anchorage.—Anchorage, sheltered from south-westerly winds by Niñ Armat Grande and Niñ Armat Pequeño, but completely exposed

Chart 1222, plan of Mataro.

to those from north-eastward, can be obtained, in a depth of 5 or 6 fathoms (9^m1 or 11^m0), about 4 cables offshore, with Mataro church bearing about 319°, distant three-quarters of a mile.

Small vessels can obtain better shelter, in a depth of 4 fathoms 5 (7^m3), about one cable east-south-eastward of Roca de la Torre.

Chart 310.

Coast.—Light.—From the mouth of Riera de San Simón, the coast trends about 2½ miles north-eastward to Punta de Morrell.

This stretch of coast is fringed by Arrecife de Morrell, on which lie, 10 close inshore, several heads, which dry. These reefs terminate at Punta de Morrell.

Placer El Vell is a stony bank, with depths of 9 fathoms (16^m3), about 1½ miles south-south-eastward of Punta de Morrell.

Montaña de Montseny, the rocky summit of which is covered with 15 snow almost the whole year, is a prominent landmark. It rises to an elevation of 5,600 feet (1,707^m0), about 16 miles northward of Mataro. See views facing page 136.

Caldetas is a town about 1½ miles north-eastward of Punta de Morrell, and the coast between them is free from off-lying dangers; 20 this town is backed by mountains, and is dominated by a hill, on the summit of which are the ruins of a tower. Arenys de Mar, a town about one mile north-eastward of Caldetas, is situated on either side of the mouth of Riera de Arenys. Pilots are available; but pilotage, 25 see page 20, is not compulsory.

Punta de la Piedad and Punta del Calvario, about one-quarter of a mile, respectively, south-westward and north-eastward of the mouth of Riera de Arenys, are at the western and eastern ends of the beach at Arenys de Mar; the former is rocky, and the latter is a small peninsula, on the summit of which are some prominent build- 30 ings; eastward of the beach begin a series of stone embankments.

Punta Portiñol lies about one-quarter of a mile eastward of Punta del Calvario, and from it a reef, some of the heads of which are above water, extends about one cable southward.

Puerto de Arenys de Mar.—Lights.—This port was under con- 35 struction in 1949. Dique de Portiñol, which was nearly completed, extended about 2½ cables west-south-westward from the middle of the western side of Punta Portiñol. A second mole, which was under construction, extended from Punta Calvario. Owing to silting, this harbour is available for small craft with local knowledge only. 40

A light (*Lat.* 41° 35' N., *Long.* 2° 34' E.) is exhibited, at an elevation of 26 feet (7^m9), from an iron column, about 100 feet (30^m5) in height, situated within the extremity of Dique de Portiñol, and is moved as the work progresses.

A light is exhibited from a wooden hut situated on the head of the 45 mole extending from Punta Calvario, and is moved as the work progresses.

Anchorage.—Caution.—With offshore winds, anchorage can be obtained either off Caldetas or Arenys de Mar, according to draught.

Landing at Caldetas can only be effected in very calm weather. 50

Small vessels can anchor off Arenys de Mar, in depths of from 2½ to 3½ fathoms (5^m0 to 5^m9).

Caution must be exercised by large vessels when anchoring off Arenys de Mar, for several detached rocky banks, with a covering of

Charts 1187, 160, 2158a.

Chart 310.

sand, and with depths of from $7\frac{1}{2}$ to 16 fathoms (13^m7 to 29^m3), lie within $1\frac{1}{2}$ miles of the coast in the vicinity.

Coast.—Danger.—Light.—The town of Canet de Mar lies about 5 one mile east-north-eastward of Punta Portiñol. Abreast the town the beach is free from dangers, but is usually fringed with breakers. Behind the beach there is a railway embankment.

San Pol is a village about 2 miles east-north-eastward of Canet de Mar, standing on the eastern side of the mouth of a stream, at the foot 10 of a hill dominated by a monastery.

Punta de San Pablo lies at the eastern end of the village of San Pol, and in its vicinity are some embankments. Eastward of San Pol, the coast is high and rocky, and fringed by a beach, and on two of the heights are towers.

15 Calella lies about $1\frac{3}{4}$ miles east-north-eastward of Punta de San Pablo. At the eastern end of the village is the railway station, with a walled cemetery beyond it, at which the above-mentioned embankments terminate.

A light is exhibited, at an elevation of 164 feet (50^m0), from a white 20 circular tower and dwelling, 33 feet (10^m1) in height, situated on a hill near the coast about half a mile west-south-westward of Calella.

A shoal, with a depth of $2\frac{3}{4}$ fathoms (5^m0), was reported, in 1924, by the Italian s.s. *Sori*, to lie about one mile south-westward of Calella lighthouse.

25 A shoal, with a depth of $1\frac{1}{2}$ fathoms (2^m7), lies about $3\frac{1}{4}$ miles east-north-eastward of Calella lighthouse.

From Calella lighthouse the coast trends about $6\frac{1}{2}$ miles east-north-eastward to the mouth of Rio de la Tordera, and is in most places free from off-lying dangers. In it are the mouths of several streams, and 30 on it are numerous buildings and the settlements of Pineda and Santa Susana, in the latter of which is a tower.

Malgrat is a village situated about $1\frac{1}{2}$ miles westward of the mouth of Rio de la Tordera.

Rio de la Tordera never dries, and after heavy rains discharges a 35 large quantity of water. The sediment brought down by the river continues to extend the point on the eastern side of its mouth, for which reason the point should be given a wide berth.

Anchorage.—With winds between north-west and north-north-east, anchorage (*Lat.* $41^\circ 37' N.$, *Long.* $2^\circ 40' E.$) can be obtained off 40 Playa de Calella, in depths of from $3\frac{1}{4}$ to $4\frac{1}{2}$ fathoms (5^m9 to 8^m2), fine sand, at a distance of about half a mile offshore.

Temporary anchorage can also be obtained, in fine weather, about 4 cables offshore, abreast Malgrat, in a depth of $4\frac{1}{2}$ fathoms (7^m8), muddy sand.

45 **Banco de Santa Susana.**—This shoal, despite its proximity to the coast, has been the scene of many disasters to coasting vessels. It lies about half a mile offshore between the meridian of the church at Pineda and that of a position close westward of Malgrat. The general depths over it are from $2\frac{3}{4}$ to $4\frac{1}{2}$ fathoms (5^m0 to 7^m8), sand; but, 50 owing to the shifting nature of the bottom, less depths may be found on it; at one time the least depth reported was less than 6 feet (1^m8). The shoal is very steep-to on its seaward side, and the sea breaks heavily over it with fresh onshore winds. Great caution should be exercised when in its vicinity.

Charts 1187, 1780, 160, 2158a.

Chart 1391, plan of Blanes bay.

Puerto de Blanes.—Danger.—Light.—The town of Blanes stands at the head of a small bay, between Punta Palomera, about $1\frac{1}{2}$ miles north-north-eastward of the mouth of Rio de la Tordera, *see* chart 310, and Punta de San Miguel, about half a mile farther north-eastward. 5 The coast between the river and Punta Palomera consists of a beach free from off-lying dangers.

Punta Palomera consists of some large rocks lying close inshore.

Punta de San Miguel rises to an elevation of 213 feet (64^m9), and is surmounted by a convent. Three above-water rocks lie within three- 10 quarters of a cable south-eastward of the point.

Puerto de Blanes is protected by a breakwater extending about $2\frac{1}{2}$ cables south-westward from Punta de San Miguel. A light is provisionally exhibited, at an elevation of 21 feet (6^m4), from a post, 7 feet (2^m1) in height; situated on the head of the breakwater. This 15 light-structure should be given a berth of 27 yards (24^m7).

Laja de Santa Ana, with a depth of $1\frac{1}{2}$ fathoms (2^m3), rock, lies about one cable south-south-westward of Punta de San Miguel.

Pilots are available; but pilotage, *see* page 20, is not compulsory.

Anchorage.—During the summer, with winds between west and 20 north-east, anchorage can be obtained either off Puerto de Blanes or off the coast between the town and the mouth of Rio de la Tordera. The best berth is, in depths of from 7 to 8 fathoms (12^m3 to 14^m6), sand, about $3\frac{1}{2}$ cables south-eastward of the town. Small vessels can anchor closer in. The anchorage is not safe in winter. 25

Chart 1391, plan of Lloret bay.

Ensenada de Lloret.—Punta de Bany's lies about $2\frac{1}{2}$ miles north-eastward of Punta de San Miguel, *see* chart 310, and the coast between them is high and rugged. Punta de Bany's is the middle one of three steep points, at the western end of the beach at Ensenada de Lloret, 30 which are fringed with rocks and reefs. The westernmost of these points is crowned by a disused fortress.

Punta de los Calafates, at the eastern end of the beach at Ensenada de Lloret, lies about $8\frac{1}{2}$ cables east-north-eastward of Punta de Bany's. 35

Anchorage.—Ensenada de Lloret is open to onshore winds, but, in fine weather, anchorage can be obtained off it. Landing is most easily affected in the western corner of the bay.

Chart 1391, plan of Tossa anchorage.

Ensenada de Tossa.—Light.—Cabo de Tossa, about $3\frac{1}{2}$ miles 40 north-eastward of Punta de los Calafates, *see* chart 310, is the extremity of a small, steep-to peninsula, surmounted by a castle.

A light is exhibited, at an elevation of 197 feet (60^m0), from a white tower surmounting a white square dwelling, 36 feet (11^m6) in height, situated on Cabo de Tossa (*Lat.* 41° 43' N., *Long.* 2° 56' E.). 45

The town of Tossa is situated on the shore of a small bay, close northward of Cabo de Tossa.

Punta de la Palma, at the northern end of the bay, is surrounded by reefs and islets, the southernmost of which, Isla de la Palma, lies about $3\frac{1}{2}$ cables north-north-eastward of Cabo de Tossa. A $2\frac{1}{2}$ -fathom 50 (5^m0) bank extends a short distance on the south-western side of the islet. No attempt should be made to pass between the islet and the coast, unless in possession of local knowledge.

Llosa de la Palma, with depths of about one fathom (1^m8), rock,

Charts 310, 1187, 1780, 160, 2158a.

Chart 1391, plan of Tossa anchorage.

lies in the northern part of the bay, about $1\frac{1}{2}$ cables westward of the northern end of Isla de la Palma.

Anchorage.—Ensenada de Tossa affords excellent shelter from winds between south-west and north. The best position berth is, in a depth of about $8\frac{1}{2}$ fathoms (15^m5), sand, eastward of the south-western corner of the bay, about $1\frac{1}{2}$ cables offshore.

Small craft can obtain shelter from southerly winds in the south-western corner of the bay, northward of the peninsula, in a depth of about $2\frac{3}{4}$ fathoms (5^m0).

Chart 310.

Coast.—From Punta de la Palma, the coast trends about $5\frac{1}{2}$ miles north-eastward to Punta de Garbi, and is backed by mountains; it is very rugged, somewhat indented, and off it are several islets lying close inshore. The coves are open south-eastward, and are available to small craft with local knowledge only.

Chart 1391, plan of San Feliu de Guixols.

San Feliu de Guixols. — Dangers. — Lights. — This town (*Lat.* $41^\circ 47' N.$, *Long.* $3^\circ 02' E.$) is situated at the head of a cove, about half a mile northward of Punta de Garbi.

Ensenada de San Feliu de Guixols is entered between Punta de Garbi and Isla de Levante, about $4\frac{1}{2}$ cables north-eastward.

Punta de Garbi is the south-eastern extremity of a high, rugged promontory, on the summit of which stands the hermitage of San Telmo. Two islets, Islote Sadolitj and Isla del Freu, lie, respectively, close off the south-western and eastern extremities of the promontory.

Llosa de Port Salvi, a rock with a depth of about 4 feet (1^m2), lies about three-quarters of a cable south-eastward of Islote Sadolitj and a rock, with a depth of less than one foot (0^m3), lies close off the eastern side of Isla del Freu.

Isla de Levante lies close inshore under a hill, 266 feet (81^m1) high, on the summit of which is a ruined mill.

A mole extends, about $2\frac{3}{4}$ cables west-south-westward, from the coast close north-westward of Isla de Levante, leaving a passage between its head and the western shore of the cove about one cable in width. In 1948, heavy seas had damaged the mole and mole head and it was dangerous to approach them too closely.

A light is provisionally exhibited, at an elevation of 31 feet (9^m4), from a mast, 18 feet (5^m5) in height, situated on the head of the mole.

Leading lights are exhibited, the front light, at an elevation of 23 feet (7^m0), from a mast, surmounted by a disc painted black and white in diagonal stripes, 18 feet (5^m5) in height, situated on the beach at the head of the harbour; and the rear light, at an elevation of 46 feet (14^m0), from a mast, surmounted by a disc painted black and white in diagonal stripes, 39 feet (11^m9) in height, situated 170 feet (51^m8) north-north-westward of the front light-structure. These lights in line, bearing 343° , lead through the entrance of the harbour; they cannot be used until within one cable of the head of the mole. In 1948, these lights were reported to be irregular.

Quays have been constructed, on the eastern side of the harbour, between the root of the mole and the head of Cala de Sans, which lies on the eastern side of a small rocky promontory surmounted by the ruins of a battery, at the eastern end of the beach fronting the town. There are depths alongside the quays of from 13 to 23 feet

Charts 1187, 1780, 160, 2158a.

Chart 1391, plan of San Feliu de Guixols.

(4^m0 to 7^m0), and along the inner side of the mole of from 27 to 29 feet (8^m2 to 8^m8).

Port facilities.—Water is laid on to the quays. A stock of coal is maintained. Minor repairs can be executed. 5

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at San Feliu de Guixols. *See* page 15.

Coast.—Danger.—From abreast Isla de Levante the rocky coast trends about half a mile east-north-eastward to Punta del Mulá. Islotes Secains and Las Belellas lie 1½ cables south-westward and 1½ cables southward, respectively, of Punta del Mulá. There is no passage between the former and the coast, but between the two groups of islets there is a channel about a cable wide, with depths of 8 fathoms (14^m6). 10

Chart 310.

Cala de San Pol is entered between Punta del Mulá and Punta de San Pol or d'en Pau, about half a mile north-eastward. 15

Punta Rojiza is a low, reddish point, on which are two hillocks, about one mile north-north-eastward of Punta de San Pol; the coast between is rocky. 20

La Llosa, with a depth of one foot (0^m3), is almost always marked by breakers, and lies about 3 cables south-eastward of Punta Rojiza. The ruined mill on the hill above Isla de Levante in line with the hermitage of San Telmo, bearing about 242°, leads south-eastward of this rock. 25

A sandy beach extends about one mile north-north-eastward from Punta Rojiza, and in the middle of it is the mouth of Riachuelo Ridaura (*Lat.* 41° 48' N., *Long.* 3° 04' E.).

Punta de Trumal, at the northern end of the above-mentioned beach, is a rocky point, and from it a rugged stretch of coast, on which is a coastguard hut, trends about 1½ miles north-north-eastward to Punta de Torre Valentina. 30

Anchorage.—Small vessels, with local knowledge, can obtain anchorage, sheltered from north-westerly and northerly winds, in Cala de San Pol, in depths of from 2½ to 5½ fathoms (5^m0 to 10^m1), sand. 35

Similar vessels can obtain anchorage, sheltered from winds between west and north, off the beach north-north-eastward of Punta Rojiza.

Chart 1391, plan of Palamós anchorage.

Palamós. — Dangers. — Lights. — Buoyage. — This town stands on a promontory, at the eastern end of a bay with a sandy beach, about 1½ miles east-north-eastward of Punta de Torre Valentina. 40

Torre Valentina stands, at the south-western end of the beach, on the northern side of Punta de Torre Valentina.

Riera de Calonge flows into the bay about 3½ cables north-eastward of Torre Valentina, and on the shore north-eastward of its mouth is the suburb of San Antonio. 45

Punta del Molino, the eastern entrance point of the bay, is the southern extremity of the above-mentioned promontory, and close off it is a steep-to islet, named La Galera.

A light (*Lat.* 41° 50' N., *Long.* 3° 08' E.) is exhibited, at an elevation of 72 feet (21^m9), from a stone tower, 26 feet (7^m9) in height, the lower part of which is hexagonal and the upper part circular, situated on Punta del Molino. Close north-westward of the lighthouse is a small low building, with a conspicuous tiled roof. 50

Charts 1187, 1780, 160, 2158a.

Chart 1391, plan of Palamós anchorage.

Llosa de Palamós, a detached shoal, with a depth of $1\frac{1}{2}$ fathoms (3^m2), rock, lies about half a mile south-westward of Punta del Molino.

- 5 A cylindrical light-buoy, surmounted by a red framework structure, exhibiting a *red group flashing* light, showing *three flashes every twelve seconds*, is moored on the western side of Llosa de Palamós.

Llosa del Molino, a small detached shoal, with a depth of 6 feet (1^m8), rock, lies about one cable westward of the extremity of Punta del Molino. A black conical buoy is moored close north-westward of this shoal.

- A breakwater extends about 4 cables west-south-westward from a position about one cable northward of the extremity of Punta del Molino. In 1948, the breakwater was badly damaged and breached
15 in places by a gale.

A light is exhibited, at an elevation of 30 feet (9^m1), from a grey column, 26 feet (7^m9) in height, situated on the head of the breakwater.

- A mole extends from the shore parallel with and about $1\frac{1}{2}$ cables
20 northward of the breakwater, and the depths at its head are from 23 to 26 feet (7^m0 to 7^m9).

A light is exhibited, at an elevation of 28 feet (8^m5), from a grey, iron column surmounting a white hut, 21 feet (6^m4) in height, situated on the head of the mole.

- 25 **Anchorage.**—Sheltered anchorage can be obtained under the lee of the breakwater.

Vessels can anchor northward of the breakwater, and secure their sterns to it.

- Care should be taken to leave room for vessels proceeding to and
30 from the berths at the mole.

Port facilities.—Fresh provisions and water can be procured. A stock of coal is maintained. Minor repairs can be executed.

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at Palamós. *See page 15.*

- 35 **Coast.—Dangers.**—From Punta del Molino, the coast trends about 9 cables north-eastward to Cabo Gros.

Mont del Padro, with a depth of $4\frac{1}{2}$ fathoms (8^m2), rock, lies within 3 cables of the coast, about half a mile north-eastward of Punta del Molino (*Lat. $41^\circ 50' N.$, Long. $3^\circ 08' E.$*).

- 40 Cabo Gros is a steep headland, 236 feet (71^m9) high.

Punta del Castell, a steep point, 118 feet (36^m0) high, with an islet close off it, lies about $8\frac{1}{2}$ cables north-eastward of Cabo Gros, and between the two headlands are Cala Fosca and Cala del Castell, on the north-eastern entrance point of the former of which is the hermitage
45 of San Esteban. The coves are only available to small craft, with local knowledge.

Chart 1804.

- From Punta del Castell, the coast trends about $1\frac{1}{2}$ miles north-eastward and northward to Cabo Roig, and is high, much indented,
50 and fringed with islets, rocks, and shoals extending in places as much as 2 cables offshore.

Off-lying dangers.—Las Hormigas are a group of rocks, the highest of which, named La Hormiga Grande, is about 39 feet (11^m9) high. The southernmost rock in the group lies about one mile south-

Charts 310, 1187, 1780, 160, 2158a.

Chart 1804.

ward of Cabo Roig, and the easternmost one is nearly $1\frac{1}{2}$ miles eastward of Punta del Castell (*Lat.* $41^{\circ} 51' N.$, *Long.* $3^{\circ} 11' E.$).

Nerera and La Sardana are two rocks lying about $2\frac{1}{2}$ cables south-south-westward and $2\frac{1}{2}$ cables north-north-eastward of La Hormiga Grande, with depths of 4 fathoms (7^m3) and $4\frac{1}{2}$ fathoms (7^m8), respectively.

A vessel without local knowledge should not attempt to pass inshore of Las Hormigas, and the group should be given a wide berth.

Coast.—Dangers.—Light.—Calella is a village about three-quarters of a mile northward of Cabo Roig.

Cabo de San Sebastián, about three-quarters of a mile east-north-eastward of Calella, is a prominent reddish headland, faced with cliffs, and on its south-western side is Cala de Llafranch, with a beach and a village at its head.

A light is exhibited, at an elevation of 548 feet (167^m0), from a white tower, 39 feet (11^m9) in height, situated about $2\frac{1}{2}$ cables northward of the southern extremity of Cabo de San Sebastián. There is a hermitage close northward of the lighthouse.

Los Ullastres, three rocky shoals close together, with a least depth of $4\frac{1}{2}$ fathoms (8^m7), lie about 4 cables southward of the southern extremity of Cabo de San Sebastián.

From Cabo de San Sebastián, the rugged and indented coast trends about $5\frac{1}{2}$ miles northward.

Punta del Banch lies about 2 miles northward of Cabo de San Sebastián, and about 2 cables southward of it is a rock awash, named Furió de l'Ayguá Gélida. Llosa de Cala Nova, a rock with a depth of $4\frac{1}{2}$ fathoms (8^m7), lies about one cable south-eastward of Punta de Banch.

Cabo Bagur, *see* view on chart 1804, lies about 4 miles northward of Cabo de San Sebastián, and on it stands a one-storied, yellow signal station, at an elevation of 354 feet (107^m9).

Punta del Palom lies about three-quarters of a mile northward of Cabo Bagur, and about 2 cables southward of it and one cable offshore, lies Furió Fito, a rock awash.

Cala de la Tuna, on the northern side of Punta del Palom, is free from dangers, and has general depths in it of 9 or 10 fathoms (16^m5 or 18^m3).

From Punta de la Sal, the northern entrance point of Cala de la Tuna, the coast trends about $1\frac{1}{2}$ miles north-westward, to Rocas del Rincón, and is rugged and foul.

Playa de Pals extends about $4\frac{1}{2}$ miles northward from Rocas del Rincón, and near the middle of this beach is the mouth of Rio Ter, with that of Rio Daró about one mile southward of it. Torre de Pals surmounts a low dune near the southern end of this beach. A shoal bank extends for some distance from the beach, and, owing to the shifting nature of the bottom, due to the deposits brought down by the rivers, a vessel should not approach within half a mile of the coast.

Chart 1391, plan of Meda islands anchorage.

At the northern end of Playa de Pals is an elevated and cliffy promontory, on the south-western side of which is the village of El Estartit. The south-eastern and north-eastern extremities of this promontory are named, respectively, Punta Guixeras and Punta Salinas. Close off Punta Guixeras lies Molinét, an islet 23 feet (7^m0) high.

Islas Medas.—Dangers.—Light.—These rocky islets, surrounded

Charts 310, 1187, 1780, 160, 2158a.

Chart 1391, plan of Meda islands anchorage.

by reefs with no passages between them, except for small craft with local knowledge, lie about half a mile south-eastward of Punta Guixeras. The passage between the group and the point is deep.

- 5 Meda Grande is the largest and north-westernmost islet.

A light (*Lat.* 42° 03' N., *Long.* 3° 13' E.) is exhibited, at an elevation of 262 feet (79^m9), from a white circular tower in the shape of a truncated cone, 12 feet (3^m7) in height, situated on the summit of Meda Grande.

- 10 El Magallót, a steep-to, detached rock, 79 feet (24^m1) high, lies about 1½ cables north-westward of Punta de la Cuetera, the northern extremity of Meda Grande.

Meda Chica, 220 feet (67^m1) high, lies close south-eastward of Meda Grande, and at the south-eastern end of the group is Mogote Bernat,

- 15 236 feet (71^m9) high. The other islets of the group are considerably lower.

Anchorage.—Fondeadero de las Medas, off the south-western side of Meda Grande, is sheltered from winds between north and north-east, and has depths of 11 fathoms (20^m1), mud or sand, from 2½ to 3½ cables

- 20 south-south-westward of the lighthouse.

The most sheltered berth for a small vessel is with Punta Salinas in line with the western extreme of Meda Grande, bearing about 346°, and the southern corner of Casa Bada, on the foreshore at El Estartit, in line with Torre Ponsa, bearing 305°.

- 25 *Chart 1804.*

Golfo de Rosas.—This gulf is entered between Cabo Utrera (Ultrera), about half a mile north-north-westward of Punta Salinas, and Cabo Norfeo, about 10½ miles north-north-eastward. Its northern and southern shores are high and steep, but at its head is a low sandy

- 30 beach, backed by an extensive plain.

Punta de Trenca Brasos is situated about 3 miles north-north-westward of Cabo Utrera, and from it the shore trends about 2 miles north-westward to Punta de Casa Gran (*Lat.* 42° 07' N., *Long.* 3° 08' E.), gradually decreasing in elevation.

- 35 Cala de Mongó, southward of Punta de Trenca Brasos, and Cala de la Clota, south-eastward of Punta de Casa Gran, are the principal coves on this stretch of coast, but both are exposed to north-easterly winds, especially the latter, and are only available to small vessels, with local knowledge, during offshore winds.

- 40 The town of La Escala is situated within Punta de Casa Gran, close eastward of a hill surmounted by an old tower. In front of the town is a small beach, protected by two reefs, which extend about 2 cables northward from the shore. Pilots are available; but pilotage, see page 20, is not compulsory.

- 45 Ampurias is a small village, near some ancient ruins, on the shore, about one mile north-north-westward of La Escala.

Playa de Ampurias extends about 8 miles northward from Ampurias to the town of Rosas, and to a great extent is backed by marshes. Along this beach are the mouths of several streams, including those of

- 50 Rio Fluviá and Rio Muga.

San Pedro and Castellón de Ampurias are situated 1½ and 2½ miles inland, on the northern banks of the two rivers; the former is partly hidden by trees, but the latter stands on a hill, 226 feet (68^m9) high, and shows up prominently from seaward.

Charts 1780, 160, 2158a.

Chart 1615, plan of Rosas bay.

Rosas.—Lights.—This town is situated at the head of Bahia de Rosas, close south-eastward of the ruins of a citadel, and the shore south-eastward of it is backed by hills.

Punta de la Ponsella is about $8\frac{1}{2}$ cables southward of the town, and on a hill above the point stand the ruins of a castle. 5

A light is exhibited, at an elevation of 79 feet (24^m1), from a white circular tower surmounting a dwelling, 36 feet (11^m0) in height, situated on Punta de la Bateria, about one cable south-eastward of Punta de la Ponsella (*Lat. $42^\circ 15' N.$, Long. $3^\circ 11' E.$*). 10

Dique de Abrigo extends about 2 cables westward from a position about one-quarter of a mile northward of Punta de la Ponsella. In 1940, about 130 feet (39^m6) of the seaward end of this mole was destroyed, and there were depths of about 10 feet (3^m0) over this part.

A light is exhibited, at an elevation of 33 feet (10^m1), from a grey, iron crane, 23 feet (7^m0) in height, situated on the visible head of Dique de Abrigo. A vessel should not approach this light-structure within one cable, in order to avoid the ruined part of the mole. 15

A mole extends about $1\frac{1}{2}$ cables from the shore, parallel with and about one-quarter of a mile northward of Dique de Abrigo. There are depths of from 13 to 16 feet (4^m0 to 4^m9) alongside its head. 20

A light is exhibited, at an elevation of 30 feet (9^m1), from a grey column, 23 feet (7^m0) in height, situated on the head of the mole.

Anchorage.—Bahia de Rosas affords excellent anchorage, sheltered from all but south-easterly and southerly winds; the bottom is in places soft mud, and in others sand, with patches of weed. 25

Small vessels usually anchor, in depths of from 3 to $4\frac{1}{2}$ fathoms (5^m5 to 7^m8), sand, southward of the ruins of the citadel, and about $1\frac{1}{2}$ cables from the beach south-westward of the middle of the town.

Larger vessels can anchor in depths of 8 or 9 fathoms (14^m6 or 16^m5), weed and muddy sand, about half a mile offshore, with the ruins of the citadel bearing about 000° , and the lighthouse on Punta de la Bateria bearing about 130° . 30

Coast.—Dangers.—From Punta de la Bateria, the coast, forming the northern shore of Golfo de Rosas trends about $1\frac{1}{2}$ miles south-eastward to Punta Falconera, and in it are two coves, named Cala de Canyellas Petitas and Cala de Canyellas Grosas. 35

Punta de la Umella and Punta del Ullastrell are the south-eastern and north-western entrance points, respectively, of the two coves, and from them rocks extend about one cable south-westward. 40

Los Branchs Canyellas (Cafiellas rocks), some of which are from 26 to 32 feet (7^m9 to 9^m8) high, lie about 3 cables south-westward of Punta de la Umella, and the channel between them and the outermost of the rocks off the point is about $1\frac{1}{2}$ cables wide, with depths from 7 to 13 fathoms (12^m8 to 23^m8). 45

Between Cabo Falco and Cabo Norfeo, about 2 miles eastward, the coast forms a bay. On the western side of this bay, about 3 cables east-north-eastward of Cabo Falco, is a rock, awash, which is usually marked by breakers. Near the head of the bay is a rock, with a depth of less than 6 feet (1^m8). Cala Murtra and Cala Rustella indent the western shore of this bay, and Cala Monjoy and Cala Pelosa its northern shore. These coves are suitable for small craft with local knowledge only. 50

Cabo Norfeo is high, steep-sided, and surmounted by the ruins of

Charts 1804, 1780, 160, 2158a.

Chart 1615, plan of Rosas bay.

a watch tower. Close off its south-eastern extremity is a high islet. This cape is free from off-lying dangers.

Cala de Jonculls is entered between Punta la Trone, the north-eastern extremity of Cabo Norfeo, and Punta de la Figuera, about one mile north-eastward. It is free from dangers, and its shores are high, rugged and barren. At its head are two coves with beaches.

From Punta de la Figuera the coast trends about 6 cables north-eastward to Punta del Moro, and thence about half a mile northward to Punta de Cala Nans (Naus).

Chart 1615, plan of Port Cadaqués.

Puerto de Cadaqués. — Dangers. — **Light.** — The town of Cadaqués (*Lat. 42° 17' N., Long. 3° 17' E.*) is situated at the head of Puerto de Cadaqués, which cove is entered between Punta de Cala Nans and Isla Arenella, about 6 cables north-north-eastward. This island lies close off the promontory forming the north-eastern side of the cove.

A light is exhibited, at an elevation of 108 feet (32^m9), from a white, circular tower surmounting a white dwelling, 23 feet (7^m0) in height, situated on Punta de Cala Nans.

Cala Nans (Naus) and Cala Conca are two coves in the high, cliffy south-western shore of Puerto de Cadaqués, and both have beaches at their heads. Between the two coves are several rocks, lying close inshore, the largest and south-easternmost of which is Cucurucú de la Cebolla.

Banco de la Devesa, on which lie some above-water rocks, extends about one cable southward and eastward from Isla Arenella.

El Cucurucú, a high conical islet, with above-water rocks close eastward and westward of it, lies within one cable south-westward of the southern extremity of Isla Arenella, and the passage between them is foul.

El Piló is a group of above-water rocks lying one cable off the north-eastern shore of Puerto de Cadaqués, about one-quarter of a mile north-westward of El Cucurucú. A concrete beacon stands on the north-westernmost of these rocks. The passage north-eastward of the rocks is available only to vessels, with local knowledge, drawing not more than 16 feet (4^m9).

La Entina, a detached shoal, with a depth of 1½ fathoms (2^m7), lies about three-quarters of a cable northward of El Sortell, an islet almost connected to the north-eastern side of Punta de Cala Conca, the north-eastern entrance point of Cala Conca.

The north-eastern shore of Puerto de Cadaqués is low, undulating and cultivated. Its north-western shore is fringed by a shoal bank extending about half a cable offshore.

A building with two towers, the western of which is the higher, stands on a hill dominating Punta de la Costa (*Lat. 42° 17' N., Long. 3° 17' E.*), about one-quarter of a mile north-north-westward of El Piló.

Bajo Pali Corna, with depths of less than 1½ fathoms (2^m7), extends about one-quarter of a cable offshore from the north-eastern side of the head of the harbour.

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at Cadaqués. *See* page 15.

Anchorage.—Directions.—A vessel of deep draught can obtain anchorage in Puerto de Cadaqués, in depths of from 5½ to 11 fathoms

Charts 1804, 1780, 160, 2158a.

Chart 1615, plan of Port Cadaqués.

(10^m1 to 20^m1), within an imaginary line joining Punta de Cala Conca and El Piló. If anchoring near the head of the harbour, a vessel should moor, with the anchors south-westward and north-eastward. Alternatively a vessel can lay out an anchor south-westward, and secure her stern to one of the bollards on the north-eastern side of the harbour. 5

Small craft usually anchor, in depths of from 1½ to 2½ fathoms (2^m7 to 5^m0), in Cala del Poal, off the north-eastern end of the town.

Chart 1804.

A vessel approaching the harbour can identify it by Montaña de Cadaqués (Los Simonets Panic), which rises to an elevation of 2,001 feet (609^m9), about 1½ miles westward of the harbour; by the hermitage of San Sebastián, situated about three-quarters of a mile east-south-eastward of Montaña de Cadaqués, *see* view B on chart 1804; and by the old convent of San Pedro de Roda, situated on the summit of 15 a mountain about 4½ miles west-north-westward of Montaña de Cadaqués.

Charts 1615, plan of Port Cadaqués, 1804.

In order to clear Banco de la Devesa, a vessel approaching the harbour should keep Isletas Massinas, *see* below, bearing less than 20 030°, and open westward of Isleta Maza del Oro, *see* page 152, until the church at Cadaqués is open westward of El Cucurucú.

Coast.—Dangers.—Punta Oliguera (*Lat.* 42° 17' N., *Long.* 3° 10' E.), about 3 cables north-eastward of Isla Arenella, is low and rocky, and the coast between is rocky and indented. 25

Baus d'en Bofill, a rocky shoal, with depths of less than 6 feet (1^m8) in places, extends about one cable from the northern side of Punta Oliguera.

Isla de Port Lligat, with Isla Fernera close off its northern end, lies within three-quarters of a mile northward of Punta Oliguera, and is 30 separated from the coast by a very narrow channel with depths less than 6 feet (1^m8).

Port Lligat, on the western side of Isla de Port Lligat, is shallow and is only available for small craft.

Isletas Massinas lie about half a mile eastward of Isla de Port Lligat, 35 and the channel between them is deep and free from dangers. The group consists of one islet and several large above-water rocks, which can be approached in safety to within about one cable.

Punta Codera lies about 6½ cables north-eastward of Punta de la Gineu, the north-western entrance point of Port Lligat, and the coast 40 between them is very indented, and has several rocks off it, but they all lie close inshore. Cala Guillola is the largest of the coves and is entered between Punta Codera and Cabo Roig, about 3½ cables west-south-westward.

Anchorage.—Cala Guillola is open south-eastward, but affords 45 shelter from northerly winds, in depths of about 8 fathoms (14^m6), sand and weed.

Chart 1804.

Coast.—Dangers.—Light.—From Punta Codera, the coast trends about 1½ miles north-eastward to Cabo Creus, and is much indented. 50

Cabo Creus is the extremity of a small dark peninsula at the north-eastern extremity of the rugged and mountainous promontory between Golfo de Rosas and Puerto de la Selva, *see* page 153.

A light is exhibited, at an elevation of 285 feet (86^m9), from a white

Charts 1780, 160, 2158a.

Chart 1804.

tower surmounting a white dwelling, 36 feet (11^m0) in height, situated on the summit of Cabo Creus (*Lat.* 42° 19' N., *Long.* 3° 19' E.), about 2½ cables within its eastern extremity.

- 5 La Encalladora or Clavaguer, an islet of moderate elevation, with a reef extending about half a cable from its south-eastern extremity, lies close off the north-eastern side of Cabo Creus, from which it is separated by a deep but very narrow channel. This channel is only available to small craft with local knowledge, and with northerly winds
10 the sea breaks right across it.

Dedos de Cadaqués are two conical peaks, about 2 miles westward of Cabo Creus, the northern of which is the higher.

- Isleta Maza de Oro, a rugged islet of moderate elevation, lies about half a mile eastward of Cabo Creus; a reef extends from its western
15 side, leaving a deep channel, about 2 cables wide, between its extremity and that of the reef extending south-eastward from La Encalladora. This channel is not recommended.

- From Cabo Creus, the coast trends about 2½ miles west-north-westward to Punta d'els Farallons, the eastern entrance point of El Golfet.
20 It is much indented, and within 3 cables of it lie several islets, rocks, and shoals.

- Cala de Culip is the cove on the north-western side of the peninsula of which Cabo Creus is the extremity, and close off its western entrance point lies Isla de Cullero, with a boat channel between it and the
25 coast.

El Golfet.—This bay is entered between Punta d'els Farallons, and Cabo Gros or Fornells, about one mile west-north-westward. There are several coves in this bay, but they are available for small craft, with local knowledge, only.

- 30 Punta d'els Farallons terminates in a white cone, close off which lie several islets. Bajo d'en Sapé, with a depth of 2½ fathoms (4^m1), lies close inshore, about one cable eastward of the point.

Cabo Gros or Fornells is steep, rocky and 557 feet (169^m8) high.

- La Galera is the largest of several islets in El Golfet, but they all lie
35 close inshore.

Anchorage.—El Golfet affords anchorage, sheltered from the winds from east, through south, to west, which are frequent in summer; but it is exposed to the northerly winds of winter, when it becomes dangerous.

- 40 **Coast.**—From Cabo Gros, the coast, rugged, barren, steep, and cliffy, trends about half a mile north-westward to Isla Madella, a rock, about 20 feet (6^m1) high, which lies close inshore, and between them are other rocks and islets lying close to the coast.

- From Isla Madella, the coast trends about 6 cables westward to Isla
45 Meda, and in it are several coves with beaches at their heads, and rocks off their entrance points.

Punta Blanca, close westward of Isla Madella, is noticeable on account of its colour, which contrasts with the dark colour of the remainder of the coast.

- 50 *Chart 1615, plan of Port Selva.*

Isla Meda, sharp-pointed and 26 feet (7^m9) high, lies close inshore. From abreast Isla Meda, the coast trends about 6½ cables west-south-westward, to Punta de la Creu, and in it are three coves, which are only available to small craft, with local knowledge.

Charts 1780, 160, 2158a.

Chart 1615, plan of Port Selva.

Puerto de la Selva.—Dangers.—Lights.—This harbour is entered between Punta de la Creu and Punta Sernella, about three-quarters of a mile west-north-westward. Its sides are fringed with rocks lying close inshore, and at its head is a beach. 5

Punta de la Creu (*Lat.* 42° 21' N., *Long.* 3° 12' E.) is situated at the foot of Puig de la Carbonera, which rises to an elevation of 390 feet (118^m9) about 2 cables within it; there is an islet close off the point.

Punta Sernella is a steep point, close off which is a rock, with a depth of 1½ fathoms (2^m7). 10

A light is exhibited, at an elevation of 72 feet (21^m9), from a grey square tower with a white cupola, surmounting a grey dwelling, situated on the north-eastern extremity of Punta Sernella.

Punta del Trench lies on the eastern side of the harbour, about 3 cables south-south-westward of Punta de la Creu, and from it a shoal 15 extends for a short distance. A mole extends about one cable west-south-westward from Punta del Trench; the outer part is in ruins. There are depths of from 10 to 33 feet (3^m0 to 10^m1) alongside the inner side of this mole where vessels can berth.

A light is exhibited from a wooden post, 8 feet (2^m4) in height, 20 situated on the head of the mole.

Puerto Reig is entered between Punta del Trench and Punta de la Timba, about 3 cables southward; the depths in this port are, for the most part, less than 3 fathoms (5^m5).

The town of Selva is situated on the eastern side of the harbour. 25 Pilots are available, but pilotage, *see* page 20, is not compulsory. Provisions and water can be procured.

Anchorage.—Puerto de la Selva is open northward, but it affords shelter with winds from all other directions.

With north-westerly winds, sheltered anchorage can be obtained 30 in the lee of Punta Sernella, in depths of 11 or 12 fathoms (20^m1 or 21^m9), but the usual anchorage is off the town, between 1½ and 2 cables offshore, in depths of from 5½ to 6½ fathoms (10^m1 to 11^m9), muddy sand.

Small vessels can anchor in depths of from 2½ to 3½ fathoms (5^m0 to 35 5^m9), mud and sand, about half a cable offshore.

Life-saving.—Life-saving appliances are maintained at Selva. *See* page 15.

Chart 1804.

Coast.—From Punta Sernella the coast trends about 1½ miles north- 40 westward to a small beach named Cau del Llop, and thence about 6 cables northward to El Castella de Llansá; the latter part is foul.

El Castella de Llansá is an islet situated about 1½ miles north-westward of Punta Sernella. It is high and rounded; a short distance northward of it is Pelandriu, a rock surrounded by a shoal bank extend- 45 ing about half a cable from it. Westward of El Castella de Llansá, there is a small fishing village.

Punta Canellas lies about 7 cables northward of El Castella de Llansá, and about three-quarters of a cable south-eastward of it lies a 4-fathom 50 (7^m3) patch.

Ensenada de Llansá is entered between El Castella de Llansá and Punta Canellas; it is open eastward and is visited by coasting vessels only.

Cabo Raso or Ras lies about 3 cables north-eastward of Punta

Charts 1780, 160, 2158a.

Chart 1804.

Canellas, and close off it are two islets, from the eastern of which a reef extends about half a cable.

5 Cabo Lladró lies about three-quarters of a mile northward of Cabo Raso. It is a whitish headland, close off which are an islet and a conical rock, both of which are whitish.

Cala Garvet (*Lat. 42° 24' N., Long. 3° 09' E.*) is entered between Cabo Raso and Cabo Lladró; it is exposed to winds from between south-east and south-west which send in a heavy sea.

10 Punta Marcé lies about one mile northward of Cabo Lladró, and between them is Cala Culera, which is also exposed to onshore winds, and in which is a coastguard station.

Punta Gatillepis lies about half a mile northward of Punta Marcé, and the coast between them is very steep, rising in the middle to an
15 elevation of over 650 feet (198^m).

Port-Bou, at the head of Cala de Port-Bou, on the northern side of Punta Gatillepis, is connected with the railway, and is the first Spanish station over the Franco-Spanish frontier.

Cap Cerbère lies about three-quarters of a mile north-north-eastward
20 of the northern entrance point of Cala de Port-Bou, and close southward of it is Cabo Falco. Close off Cap Cerbère is an islet of moderate elevation.

The whole of the coast between Cabo Lladró and Cap Cerbère is high, rugged, and moderately steep-to; the current off it is influenced
25 by the prevailing wind.

For a description of the coast northward of Cap Cerbère, *see* Mediterranean Pilot, Vol. II.

Anchorage.—Cala Garvet (*Lat. 42° 24' N., Long. 3° 09' E.*) affords good anchorage, with offshore winds, to vessels with local knowledge,
30 in a depth of 6 fathoms (11^m0), with the higher of the two islets off Cabo Raso in line with the summit of the hill above Cabo Gros, bearing about 133°.

Charts 1780, 160, 2158a.

CHAPTER IV

ISLAS BALEARES

Chart 1187.

GENERAL REMARKS.—Islas Baleares form a group consisting of four principal islands, Formentera, Ibiza, Majorca, and Minorca, together with a number of adjacent islets.

The group is situated off the southern end of the eastern coast of Spain and the principal islands lie in pairs on two banks with depths of less than 100 fathoms (182^m9). 5

In general, the northern coasts of the islands are high, rocky, and steep-to, whereas the southern coasts are nearly everywhere low and accessible. 10

Ibiza and Majorca are high and mountainous, but Formentera and Minorca are less elevated.

The population of the islands, in 1947, amounted to about 428,823.

Off-lying banks.—Banc de l'Emile Baudot, with a depth of 64 fathoms (117^m0), lies about 43 miles eastward; and another bank, with a depth of 55 fathoms (100^m6), lies about 11 miles east-north-eastward of the eastern extremity of Isla Formentera. 15

Chart 3276, plan of Ibiza, etc.

ISLA FORMENTERA.—This island, the smallest and south-westernmost of the principal Islas Baleares, is situated with Cabo Berberia, its south-western extremity, about 54 miles eastward of Cabo de la Nao, *see* page 111. From a distance southward, it appears as two islands. 20

Western side of Isla Formentera.—**Light.**—Cabo Berberia, a steep-to cliffy headland, 164 feet (50^m0) high, is the south-western extremity of a promontory, named Guillén, which rises to an elevation of 351 feet (107^m0). Torre Berberia, the top of which attains an elevation of 242 feet (73^m8), is a truncated cone, about 30 feet (9^m1) in height; it stands near the edge of the cliffs, close north-eastward of the extremity of Cabo Berberia, but on certain bearings is not easily seen against the higher land behind it. 30

Punta Rasa (*Lat.* 38° 41' N., *Long.* 1° 23' E.), about 3 miles northward of Cabo de Berberia, is 59 feet (18^m0) high, and the coast between them is faced with steep-to cliffs, in places more than 260 feet (79^m2) high. 35

Punta Gabina, 46 feet (14^m0) high and surmounted by a tower about 28 feet (8^m5) in height, lies about 1½ miles northward of Punta

Charts 1766, 2158a.

Chart 3276, plan of Ibiza, etc.

Rasa, and between them is a bay, with cliffy shores, in the south-eastern corner of which is Cala Sahona, only available to small craft, with local knowledge.

- 5 Punta Pedreras lies about $1\frac{1}{2}$ miles north-eastward of Punta Gabina, and the coast between them is cliffy.

Ensenada del Cabrito is entered between Punta Pedreras and Isla Sabina, lying close off Punta Sabina, about three-quarters of a mile eastward. In the south-eastern corner of the bay is the narrow
10 entrance of Estanque del Pez (Peix), a shallow lagoon, only available to small craft with local knowledge.

A light is exhibited, at an elevation of 43 feet (13^m1), from a grey tower, 31 feet (9^m4) in height, situated on Punta Sabina.

- Isla Sabina is low, flat and connected with Isla Formentera by a
15 breakwater forming Cala Sabina, the shores of which cove are partly rocky and partly sandy. In its south-western corner is a landing place, and at its head is a dredged, but not navigable, channel, leading to a shallow lagoon, named Estanque Pudent. On the north-eastern side of Cala Sabina, about one mile north-eastward of Isla Sabina, is
20 a windmill.

Playa de las Isletas (*Lat.* $38^{\circ} 45' N.$, *Long.* $1^{\circ} 26' E.$) is a cove amongst some rocky islets, close northward of the above-mentioned windmill. It is available for small craft, with local knowledge, only.

- Los Trocados is a narrow tongue of sand, with some rocky outcrops
25 and dunes on it, which extends about one mile northward from the northern entrance point of Playa de las Isletas. This tongue is so low and narrow, in places, that, in bad weather, the sea breaks right across it.

Anchorage.—Ensenada del Cabrito affords well-sheltered anchor-
30 age, in its western part, to small vessels with local knowledge, in a depth of about $4\frac{1}{2}$ fathoms (7^m8), weed.

Cala Sabina affords shelter from offshore winds, to vessels with local knowledge, in depths less than 6 fathoms (11^m0), where the bottom is sand, but in greater depths it is weed with patches of rock.

- 35 In fine weather, anchorage can be obtained anywhere between Punta Pedreras and the northern end of Los Trocados, in depths of from $5\frac{1}{2}$ to $13\frac{1}{2}$ fathoms (10^m1 to 24^m7); the bottom is mostly weed, with patches of sand, rock, or gravel; in depths less than $5\frac{1}{2}$ fathoms (10^m1), sand predominates in the eastern part, and rock in the southern
40 part.

Southern side of Isla Formentera.—**Light.**—Ensenada de Mitjorn, or Mediodia, is entered between Cabo Berberia and Punta Grava, about $6\frac{1}{2}$ miles eastward.

- Punta Anguila lies about $2\frac{1}{2}$ miles north-eastward of Cabo de Ber-
45 beria, and the shore between them is high, cliffy, and inaccessible.

Torre de Catalá stands at the head of Ensenada de Mitjorn, about 2 cables inland; it is 30 feet (9^m1) in height, and surmounts a small hill, sparsely covered with pine trees, its top being at an elevation of 105 feet (32^m0). The shore in its vicinity is rocky in places.

- 50 Playa de Mitjorn, or del Sur, between Torre de Catalá and Punta Grava, lies on the south-western side of a low narrow tongue of land which joins La Mola to the main part of Isla Formentera. At its south-eastern end is a very white dune, which shows up against its dark background of pine groves.

Charts 1187, 1766, 2158a.

Chart 3276, plan of Ibiza, etc.

From Punta Grava the coast trends about 2 miles westward to Punta Rotja, forming the southern side of La Mola.

In 1946, it was reported that the depths close southward of Cabo Berberia, Punta Grava and Punta Rotja were considerably shoaler 5 than those charted.

La Mola, *see* view facing page 137, is a flat-topped promontory, the seaward sides of which are faced with high cliffs. It is wooded in places, and on it there are numerous buildings.

Punta Single Mal, or de Codolar, the eastern extremity of the island, 10 lies about one mile north-eastward of Punta Rotja.

Formentera light is exhibited, at an elevation of 466 feet (142^m0), from a red tower surmounting a white, one-storied dwelling, 72 feet (21^m9) in height, situated on Punta Single Mal. *See* view facing 15 page 137.

Eastern side of Isla Formentera.—Dangers.—Punta la Creu (*Lat.* 39° 41' N., *Long.* 1° 34' E.), the northern extremity of La Mola, lies about 2 miles north-north-westward of Punta Single Mal.

A detached rock, with a depth of about 4 feet (1^m2), lies one-quarter of a cable offshore about 1½ miles south-westward of Punta la Creu. 20

Playa de Tramontana, or del Carnache, lies on the north-eastern side of the isthmus of La Mola, and near its south-eastern end is Cala de San Agustin, or El Caló, where there is a small village. The cove is only available to small craft, with local knowledge, in fine weather.

Punta Prima is a low rocky point, about 5 miles north-westward of 25 Punta la Creu, and about 3 cables southward of it is a tower, in the form of a truncated cone, 30 feet (9^m1), in height, the top of which attains an elevation of 134 feet (40^m8).

Cala Pujols, at the head of the bay on the western side of Punta Prima, is open northward, but is frequented by fishing boats. The 30 shores of the bay are foul, and in addition to several rocky islets, joined to the shore by tongues of sand, there are a number of rocks awash.

From the western entrance point of Cala Pujols, the coast trends about 2½ miles north-north-westward, forming the eastern side of Los 35 Trocados.

Anchorage.—Ensenada de Tramontana is entered between Punta la Creu and Punta Prima; it is open north-eastward, but affords anchorage during onshore winds.

Chart 3276, plan of channels between Ibiza and Espalmador. 40

Isla Espalmador.—Dangers.—Light.—This island is situated northward of Isla Formentera, and is connected with Los Trocados by a shallow bank, on which lies a reef; the sea breaks right across this bank in bad weather. The northern and eastern coasts of the island are sandy, with patches of rock; the western coast, which is the 45 highest, is faced with red cliffs in places.

Puerto del Espalmador is a small bight on the south-western coast of Isla Espalmador, which is available to small craft, with local knowledge, only. Islote Gastabi, a steep-to islet, lies in the approach to Puerto del Espalmador. 50

A prominent, circular tower, 31 feet (9^m4) in height, the top of which attains an elevation of 110 feet (33^m5), stands on the edge of the cliffs about 3½ cables northward of Punta Gastabi, the north-western entrance point of Puerto del Espalmador.

Charts 1187, 1766, 2158a.

Chart 3276, plan of channels between Ibiza and Espalmador.

Isla Torretas is connected by shoals with the western side of the northern part of Isla Espalmador.

Isla los Puercos is a low islet connected by shoals with the northern end of Isla Espalmador; it is foul on its seaward sides for a short distance.

A light is exhibited, at an elevation of 92 feet (28^m0), from a grey circular tower, 82 feet (25^m0) in height, situated on the north-western extremity of Isla los Puercos.

10 Bajo de Cala Bochs, with a depth of 3½ fathoms (6^m4), rock, lies about 7 cables south-eastward of Isla los Puercos.

Isla Espardell.—Light.—This island lies about 2½ miles eastward of Isla los Puercos, and the channel between them is named La Estancia; the island is 95 feet (29^m0) high, and its northern end and 15 eastern side are cliffy, but its western side is sloping and accessible.

A light is exhibited, at an elevation of 69 feet (21^m0), from a white tower, 51 feet (15^m5) in height, in the shape of a truncated cone with an exterior staircase, situated close to the northern end of Isla Espardell (*Lat.* 38° 48' N., *Long.* 1° 29' E.).

20 Piedro Espardello de Tramontana is a steep-to, above-water rock, about 1½ cables northward of the northern extremity of Isla Espardell; there are depths of 5 fathoms (9^m1) between them.

Ensenada de Tramontana is entered between the northern extremity of Isla Espardell and Punta de Talayas or La Galera, about 4 cables 25 south-south-eastward.

Espardello is a low, flat islet situated close off Punta de Mitjorn, the southern extremity of Isla Espardell; the narrow passage between them is foul. A reef extends a short distance from the south-eastern extremity of Espardello.

30 **Los Freus.—Dangers.—Light.**—Between Isla Espalmador and the southern end of Ibiza is a ridge on which lie several islets.

Los Freus is the collective name of three channels across the above-mentioned ridge.

Freu Grande, the southernmost and deepest channel, is between 35 Isla los Puercos and Isla Ahorcados; it is about one mile wide, with depths of from 3½ to 5½ fathoms (6^m4 to 9^m6), but it does not appear to have been closely examined. During gales, the currents in the channel are strong and irregular; they usually set in a direction contrary to that of the prevailing wind, so that heavy seas are frequently experienced in it. A vessel taking the channel is recommended to keep 40 the northern extremity of Isla Espardell bearing 090°, on which bearing the least depth will be 5 fathoms (9^m1), but there are depths of 4½ fathoms (8^m2) close northward and southward of this line.

Isla Ahorcados is 33 feet (10^m1) high, rocky and fringed with a shoal 45 bank extending a short distance offshore.

A light is exhibited, at an elevation of 88 feet (26^m8), from a yellow tower, 56 feet (17^m1) in height, situated on the southern extremity of Isla Ahorcados.

Bajo Ahorcados is a small, detached, rocky patch, with a depth of 50 2½ fathoms (4^m6), situated about 3 cables south-westward of Isla Ahorcados.

A detached rocky patch, with a depth of 5½ fathoms (9^m6), lies about 3½ cables south-south-westward of Isla Ahorcados, and in bad weather heavy seas are experienced over it.

Charts 1187, 1766, 2158a.

Chart 3276, plan of channels between Ibiza and Espalmador.

Islas Negras, two dark, flat, rocky islets, 13 and 16 feet (4^m0 and 4^m9) high, respectively, lie on a shoal about 2 cables westward of Isla Ahorcados. There are depths of 3 fathoms (5^m5) in the channel between Islas Negras and the shoal bank extending from Isla Ahorcados. 5

Bajo Enteniment, a rock with a depth of about 3 feet (0^m9), lies about half a cable north-north-westward of the northern and higher of Islas Negras.

Freu Mediano, between the shoals surrounding Isla Ahorcados and a spit extending southward from Islote El Caragolé, has a navigable 10 width of about 2½ cables, with a least depth of 3½ fathoms (6^m4), but it is not recommended, and in bad weather the sea sometimes breaks right across it.

Islote El Caragolé, a rocky islet, 26 feet (7^m9) high, lies about one cable within the southern extremity of a shallow spit which extends 15 about 4½ cables south-south-eastward from Punta Portas, the south-eastern extremity of Ibiza.

Piedra la Barqueta (*Lat.* 38° 49' N., *Long.* 1° 24' E.), about one-quarter of a mile west-south-westward of Islote El Caragolé, is awash, and is not always marked by breakers. 20

Freu Chico, between Islote El Caragolé and the above-water rocks close off Punta Portas, is only available to small craft, with local knowledge, in fine weather. There is a tower, 35 feet (10^m7) in height, on Punta Portas, the top of which attains an elevation of 68 feet (20^m7). 25

Punta Rama, on the northern side of the western approach to Los Freus, is about 1½ miles westward of Punta Portas, and should not be approached closely, for within one cable southward of it are Farallons de Punta Rama, and about 2 cables eastward of it, lies Morenallet, an above-water rock. 30

Anchorage.—La Estancia affords temporary anchorage, sheltered from eastward by Isla Espardell, from southward and westward, respectively, by Isla Formentera and Isla Espalmador, and from northward by Ibiza; but easterly winds raise a considerable sea. The holding ground is good in depths of from 11 to 13½ fathoms (20^m1 35 to 24^m7), weed, and a good berth is with the cliffs of Cabo Falcó in line with Islas Negras, bearing about 307°, and the northern extremity of Isla Espardell bearing 060°; care must be taken, however, to avoid Bajo de Cala Bochs.

Fondeadero de la Canal, between Punta Portas and Punta Rama, 40 and at the head of which is Playa de Mitjorn, affords anchorage in its western part, sheltered from all but south-westerly winds; the bottom is mostly weed, but there are some sandy patches. In the north-western corner of the bay is a small pier, near a building, and off it is a mooring-buoy. 45

Chart 3276, plan of Ibiza, etc.

IBIZA.—**General Remarks.**—This island has a somewhat indented coast, forming many coves and two ports, Puerto de San Antonio, on the north-western side, and Puerto de Ibiza, on the south-eastern side. It is highest near its south-western end, where Monte Atalayasa 50 rises to an elevation of 1,558 feet (474^m9).

South-western side of Ibiza.—**Submarine cable.**—Cabo Falcó, see plan of channels between Ibiza and Isla Espalmador on chart

Charts 1187, 1766, 2158a.

Chart 3276, plan of Ibiza, etc.

3276, is about 3 cables north-north-westward of Punta Rama ; it is high and cliffy, and terminates in a small, somewhat salient point.

Ensenada de Codolá is entered between Cabo Falcó and Punta Yondal, about $2\frac{1}{2}$ miles north-westward. It has a stony beach and the entrance points are high.

Punta Yondal is low, rocky and faced with cliffs, especially its western side. It projects southward from a hill, 525 feet (160^m0) high, named Yondal. A reef extends about $1\frac{1}{2}$ cables southward from Punta Yondal.

Cala Yondal is entered between Punta Yondal and Punta de Port-Roig, about one mile west-north-westward.

Punta de Port-Roig is flat, and has a small reef on its southern side. The coast on the eastern side of this point consists of white cliffs.

15 Cala Port-Roig is a cove, with reddish shores, which is entered on the northern side of Punta de Port-Roig. It has a sandy beach, and Punta de las Isletas, the northern entrance point, takes its name from some islets, about 10 feet (3^m0) high, close off it. A submarine cable, the route of which is indicated on the chart by a pecked line, is landed 20 at Cala Port-Roig; see page 19.

Ermita Cubells is a prominent building standing, at an elevation of 364 feet (110^m9), on the cliffs about $1\frac{1}{2}$ miles west-north-westward of Punta de las Isletas. The coast between consists of cliffs, the highest part of which is at a blackish point, named Cabo Negret.

25 Cala Llentrisca is a very small cove, about $1\frac{1}{2}$ miles south-south-westward of Ermita Cubells (*Lat. $38^\circ 52' N.$, Long. $1^\circ 15' E.$*).

Cabo Llentrisca, about half a mile south-south-westward of Cala Llentrisca, is a white, salient, cliffy headland, 485 feet (147^m8), high. Near the coast about $1\frac{1}{2}$ miles northward of Cabo Llentrisca, Monte

30 Llentrisca rises to an elevation of 1,358 feet (413^m9).

Cabo Jueu or del Judío, about $1\frac{1}{2}$ miles north-north-westward of Cabo Llentrisca, is a spur of Monte Atalayasa. It is high and covered with pine trees ; on it stands an ancient tower, and at its extremity is La Oliva, a large and prominent rock.

35 Cap Blanch is a whitish cliffy headland, about half a mile northward of Cabo Jueu.

Cala de Horts, about half a mile northward of Cap Blanch, has a beach of whitish stones, and is not recommended as an anchorage. Islote Escull, 26 feet (7^m9) high, lies about half a cable off the north-

40 western entrance point of the cove.

Off-lying islets and dangers.—Light.—Islote Vedrá lies about one mile westward of Cabo Jueu. It is reddish in colour, steep-to in most places, and almost inaccessible, but on its northern side is a place where landing can be effected, with local knowledge. At the western 45 end of the islet is a pronounced cone, and there are two similar cones at its eastern end, the northern and higher of which is 1,253 feet (381^m9) high, see view facing this page. Close off the north-eastern side of the islet are Islote Galera and other above-water rocks.

A light is exhibited, at an elevation of 51 feet (15^m5), from a white, 50 conical tower, 13 feet (4^m0) in height, situated on the western extremity of Islote Vedrá.

Islote Vedranell, situated between Islote Vedrá and Cabo Jueu, is steep-to, 410 feet (125^m0) high, and inaccessible.

El Materet (Mataret), with a depth of $3\frac{3}{4}$ fathoms (6^m9), lies on the

Charts 1187, 1766, 2158a.

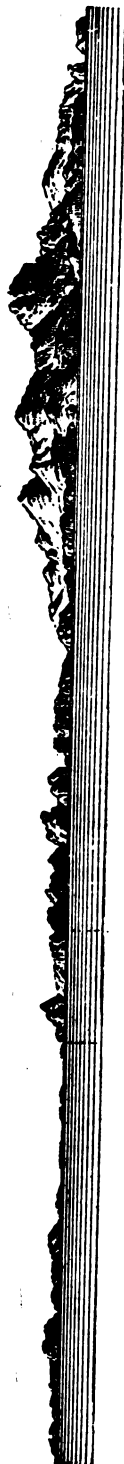


*Isle Vedrá
summit, bearing
337°, 6 miles.*

Isle Vedránell.

Cabo Juen.

Islets off south-western extremity of Ibiza from southward.

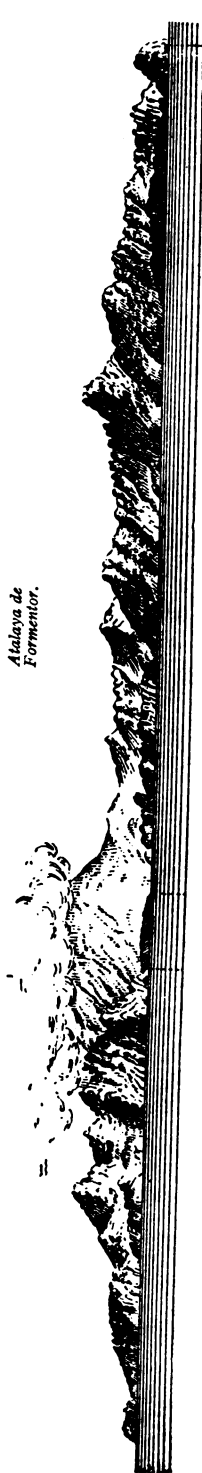


*Atalaya de
Mórey.*

*Cabo Formenter,
bearing 205°, 29 miles.*

*Puig
Mayor. Puig de
Torrellas.*

Promontorio del Formenter from north-eastward.



*Cabo Cabo del
Menorca. Pinar.*

Bahia de Pollensa.

Promontorio del Formenter from east-south-eastward.
(Originals dated 1893.)

*Cabo
Formenter,
bearing 288°, 16 miles.*

*Puig
Son Jaumez.*



*Cabo
Verney.*

*Cabo
Pera.*

*Cabo
del Freu.*

*Morro de
Aubarca.*

*Alalaya
de Morry.*

*Cabo Farruch,
bearing 242°,
12½ miles.*

Part of the eastern coast of Majorca from north-eastward.
(Original dated 1893.)

Chart 3276, plan of Ibiza, etc.

extremity of a rocky spit, which extends about 4 cables south-westward from Cap Blanch.

La Bota, about one mile north-north-westward of the western extremity of Isote Vedrá, is above water, and the slightest sea breaks 5 heavily over it.

Though there are deep channels between Isote Vedrá and the coast of Ibiza, they should not be attempted without local knowledge.

La Xemena, with a depth of 19 fathoms (34^m7), rock, lies about three-quarters of a mile north-westward of La Bota, and in bad 10 weather should be carefully avoided, for very heavy seas are then encountered over it.

Anchorage.—Ensenada de Codolá affords anchorage, sheltered from north-easterly and south-easterly winds, but is exposed to winds from the opposite quarters. The bottom is mostly sand, but near the 15 entrance points it is rocky.

Cala Yondal affords anchorage, sheltered from all but south-westerly winds, but is only available to small craft, with local knowledge.

Western side of Ibiza.—**Submarine cable.**—Puig Pelat (*Lat.* 38° 54' N., *Long.* 1° 13' E.), about one mile northward of Isote Escull 20 de Cala Horts, is a rounded hill, 607 feet (185^m0) high, situated near the coast.

Cala Badella is entered about three-quarters of a mile northward of Puig Pelat, and close off its northern entrance point is a small shoal.

Punta Embarcadó is situated about 2½ miles northward of Cala 25 Badella, and in the bay between them are several coves. A submarine telegraph cable, *see* page 19, the route of which is indicated by a pecked line on the chart, is landed at Cala Moli, the southernmost of these coves.

Punta de la Torre de Rovira lies about 1½ miles north-north-eastward 30 of Punta Embarcadó, and on it is an ancient tower, 33 feet (10^m1) in height, the top of which is at an elevation of 72 feet (21^m9).

Cabo la Basa is situated about half a mile eastward of Punta de la Torre de Rovira.

Cala Rotja and Cala Basa are two unimportant coves on the western 35 and eastern sides, respectively, of Cabo la Basa.

From the eastern entrance point of Cala Basa, the coast trends about half a mile eastward to Punta Pedrera.

Cala Port del Torrent is entered between the eastern side of Punta 40 Pedrera and Punta Coralls, about 2 cables eastward.

Off-lying islets and dangers.—**Lights.**—Isla del Esparto, 226 feet 40 (68^m9) high, lies about three-quarters of a mile westward of Punta Embarcadó. Its coasts are mostly cliffy and steep-to, but an islet lies close off either end.

Islas Bledas, five in number, lie within 2 miles north-westward of 45 the western end of Isla del Esparto. They consist of Bleda Pequena, the southernmost, also known as Porros, which is divided into two parts, the northern part being known as La Gorra; Bleda Mayor, 128 feet (39^m0) high and steep-to; Bleda Plana, with two islets and some foul ground off its south-western side; Redonda del Oeste, close 50 northward of Bleda Plana, with foul ground between; and Redonda del Este, 43 feet (13^m1) high and steep-to.

A light is exhibited, at an elevation of 80 feet (24^m4), from a white conical tower, 13 feet (4^m0) in height, situated on Bleda Plana.

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Chart 3276, plan of Ibiza, etc.

Isla Bosque lies about one-quarter of a mile offshore, between Punta Embarcadó and Punta de la Torre de Rovira. It is 220 feet (67^m1) high, surrounded by cliffs, and at its northern end are two high rocks ; the passage between it and the coast of Ibiza is foul.

Conejera Grande lies about one-quarter of a mile northward of Isla Bosque, and is 226 feet (68^m9) high ; its coasts are mostly cliffy. The passage between Conejera Grande and Isla Bosque is foul.

Las Conejeras is the collective name of Isla Esparto, Isla Bosque, and Conejera Grande.

A light is exhibited, at an elevation of 289 feet (88^m1), from a white tower and dwelling, 54 feet (16^m5) in height, situated on Cabo Blanco, the northern extremity of Conejera Grande. See view facing page 137.

Isote Payaret lies about 2 cables north-eastward of Punta de la Torre de Rovira, and is steep-to.

Anchorage.—Small craft, with local knowledge, can obtain anchorage, with offshore winds, in Cala Badella.

Chart 3277, plan of Puerto de San Antonio.

Puerto de San Antonio.—**Light.**—Puerto de San Antonio is entered between Punta Chínco, about 8 cables east-north-eastward of Punta Corral, and Cap Blanch or Cabo Blanco, about one mile farther northward ; its head and southern side are shoal.

San Antonio (*Lat.* 38° 59' N., *Long.* 10° 18' E.) is a village, situated on the northern side of the head of the port, at which there are landing places, approachable only by boats.

Punta de Covas Blancas is situated on the northern side of the port, about three-quarters of a mile south-eastward of Cap Blanch.

A light is exhibited, at an elevation of 72 feet (21^m9), from a red octagonal tower and two-storied dwelling, 33 feet (10^m1) in height, situated on Punta de Covas Blancas.

Punta Móri lies about 1½ cables north-north-westward of Cap Blanch, and Cala Grassió, in which there are two sandy beaches, is entered between them.

Anchorage.—In summer anchorage can be obtained in Puerto de San Antonio. A good berth, for a vessel of moderate size, is, in depths of 5½ fathoms (10^m1), with the lighthouse bearing about 002°, and the prominent, white, disused Buenavista mill, on the southern side at the head of the port, bearing 132°.

Chart 3276.

North-western side of Ibiza.—Cabo Negret, about 7 cables north-north-westward of Cap Blanch, has a rounded summit which is covered with trees.

Cala Salada is entered about one mile north-eastward of Cabo Negret. In the middle of the cove, and about half a cable from the beach at its head, is a flat rock, with a depth of 1½ fathoms (2^m7), and close off the northern entrance point of the cove lies Isote Salada, 26 feet (7^m9) high.

Cabo Nonó, about one mile northward of Isote Salada, is prominent, and 846 feet (257^m9) high ; its rounded summit is covered with pine trees, and its seaward side is cliffy ; at the foot of the cliffs, and extending about three-quarters of a cable from them, is a white point, 59 feet (18^m0) high.

Cabo Negrete, about 1½ miles north-eastward of Cabo Nonó, and

Charts 1187, 2158a.

Chart 3276.

the coast between them is high and cliffy. Cabo Negrete is higher than Cabo Negret farther southward.

Islas Margaritas, two in number, lie close together about 3 cables north-north-eastward of Cabo Negrete. The eastern and larger islet is in the shape of a horse-shoe, and is pierced by a natural tunnel; the passage between the islets and the coast of Ibiza is deep and free from dangers.

Punta Castella, about three-quarters of a mile north-eastward of Cabo Negrete, is a high cliff. 10

Punta Torretas, about three-quarters of a mile north-north-eastward of Punta Castella, is pierced by a natural tunnel. It is a salient point which, at a distance, and on certain bearings, appears as two towers of a fortress.

Cabo Eubarca, about three-quarters of a mile north-eastward of Punta Torretas, is high, cliffy, and easy to identify, for at its extremity is a regular cone, 860 feet (262^m1) high. 15

Anchorage.—Small vessels, with local knowledge, can obtain anchorage, sheltered from north-easterly and south-easterly winds, in Cala Salada; the holding ground, which is of sand and weed, is good, 20 and the depths decrease gradually from about 8 fathoms (14^m6) in the entrance; care must be taken to avoid the rock described above.

Northern side of Ibiza.—Cabo Rubió, about 1½ miles east-north-eastward of Cabo Eubarca, is high and salient. Ensenada de Eubarca, which is entered between the two capes, is quite exposed, but is free 25 from dangers and its shores are high, cliffy, and of a reddish colour.

Punta de la Creu, about 1½ miles north-eastward of Cabo Rubió, is high and cliffy, and in the south-western corner of the bay between them is a very small cove.

Isla Murada (*Lat.* 39° 06' N., *Long.* 1° 26' E.) lies about 1½ cables off 30 the north-eastern side of Punta de la Creu.

Punta Cova de Orenga, about 1½ miles east-north-eastward of Punta de la Creu, is a high cliffy point in which is a large cave.

Ensenada de San Miguel is entered between Punta de la Creu and Punta Cova de Orenga. 35

Torre de San Miguel, about 3 cables southward of Isla Murada, is 30 feet (9^m1) in height, and stands on the western side of the bay; its top attains an elevation of 348 feet (106^m1).

Isla Bosch, steep and reddish, is connected with the mainland by an isthmus, and lies about 3½ cables south-eastward of Isla Murada. 40 Puerto de San Miguel is entered between Isla Bosch and Punta Blanca about 1½ cables eastward. Punta Blanca is reddish and is faced by cliffs.

Cala Binirrás is entered between Punta Blanca and Punta Negra, about 3½ cables north-eastward; in the entrance is Cap Bernat, a 45 steep-to islet, 88 feet (26^m8) high.

Isla del Caldés, steep, rocky and 66 feet (20^m1) high, lies about half a mile north-eastward of Punta Cova de Orenga. It is connected with the coast by a narrow isthmus, and close off its western side is a flat rock, with a depth of about 2 feet (0^m6). 50

Punta Charracó, about 1½ miles east-north-eastward of Isla del Caldés, is 240 feet (73^m1) high, and covered with trees; the coast between them is high.

Ensenada Charraca is entered between Punta Charracó and Punta

Chart 3276.

del Marés, about three-quarters of a mile east-north-eastward; close to the western shore of the bay are two islets. Cala Charraca lies at the head of Ensenada Charraca.

- 5 Punta del Marés is surmounted by a tower, 30 feet (9^m1) in height, the top of which attains an elevation of 177 feet (53^m9).

Cala de Portinatx is entered between Punta del Marés and Punta Galera, about one-quarter of a mile north-eastward.

- Punta Moscarté, the northern extremity of Ibiza, is situated about 10 one mile east-north-eastward of Punta Galera, and off it a west-going current is usually experienced.

Cala de Serra is entered about three-quarters of a mile southward of Punta Moscarté, and Port de las Caletas about the same distance farther south-eastward.

- 15 Atalaya de San Vincente is faced with a cliff, 994 feet (303^m0) high, at the head of a small bay close eastward of Port de las Caletas.

Escull de Pas is an islet lying close off the eastern entrance point of the above-mentioned bay, about three-quarters of a mile south-eastward of which point Puig Caragol rises to an elevation of 522 feet

- 20 (159^m1), and has a prominent cliffy summit.

Punta del Escullet lies about 1½ miles eastward of Escull de Pas; and Islas Hormigas, two islets about 100 feet (30^m5) high, lie close together about one cable north-north-westward of this point.

- Punta Grosa (Grossa), close off which lies an islet, is situated about 25 1½ miles south-eastward of Punta del Escullet; it is high and cliffy.

Southern part of the eastern side of Ibiza.—Punta de Corpmari (*Lat. 38° 51' N., Long. 1° 24' E.*) lies about 1½ miles northward of Punta Portas, *see* page 159, and the coast between is low. At the foot of the cliffs forming this point lie two islets. Sierra de Corpmari rises to an

- 30 elevation of 522 feet (159^m1) about half a mile westward of the point.

From Punta de Corpmari the cliffy coast trends about one mile northward to Punta de Torre de La Sal Rossa close off the latter point stands an islet. Torre de La Sal Rossa is 30 feet (9^m1) in height, and its top attains an elevation of 92 feet (28^m0); it stands on Punta de

- 35 Torre de La Sal Rossa.

From Punta de Torre de La Sal Rossa, Playa d'en Bossa extends about 1½ miles north-north-eastward to Punta de la Mata, and is backed by low land.

- Off-lying islets and dangers.**—**Light.**—La Esponja lies about 40 one mile eastward of Torre de La Sal Rossa; it is 34 feet (10^m4) high, its sides are vertical, and its summit is rounded.

Bajo de la Esponja, with a depth of 6½ fathoms (11^m9), rock, lies about one cable south-south-westward of La Esponja.

- In 1946, it was reported that the depths in the channel between La 45 Esponja and Torre de La Sal Rossa had decreased considerably.

Chart 3277, plan of Puerto de Ibiza.

- Islotes Malvins are two islets, the southern of which lies about one mile south-eastward of Punta de la Mata and is 66 feet (20^m1) high. It is fringed with reefs, some islets lie about three-quarters of a cable 50 north-north-eastward of it, and shoals, with depths of less than 3 fathoms (5^m5), lie within 1½ cables north-north-westward and half a cable south-south-westward of it. The northern islet, about one-quarter of a mile north-north-eastward of the southern one, is 39 feet (11^m9) high, and is fairly steep-to; two islets lie close off its north-

Chart 3277, plan of Puerto de Ibiza.

western extremity. The group is covered by the *red* sector of the light on Botafoch, *see* below, between the bearings 033° and 042°.

Bajo Malvina, with a depth of $4\frac{1}{2}$ fathoms (8^m2), rock, lies about $3\frac{1}{2}$ cables westward of the southern of Islotes Malvins. 5

Los Dados are two islets which lie about 6 cables east-north-eastward of the northern of Los Malvins. Dado Grande is 43 feet (13^m1) high. Dado Pequeño is 30 feet (9^m1) high and lies about $1\frac{1}{2}$ cables south-eastward of Dado Grande; about one-quarter of a cable north-north-westward of it is a rock, with a depth of less than 6 feet (1^m3). 10

A small reef, with a depth of one-quarter of a fathom (0^m5), lies midway between Dado Grande and Dado Pequeño.

A light is exhibited, at an elevation of 43 feet (13^m1), from a grey, metal column, 20 feet (6^m1) in height, situated on Dado Grande.

Islas Ratas, 36 feet (11^m0) high, lies about 2 cables eastward of 15 Punta de la Mata; the channel between is shoal.

Puerto de Ibiza.—Lights.—Buoyage.—Punta Marloca, the western entrance point of Puerto de Ibiza, lies about one mile east-north-eastward of Punta de la Mata, and is the south-eastern extremity of a promontory which rises to a hill surmounted by a castle and a 20 cathedral. The tower of the cathedral attains an elevation of 338 feet (103^m0), and that of the castle 328 feet (100^m0). Islotes Negras, composed of blackish rock and 10 and 39 feet (3^m0 and 11^m0) high, respectively, lie about 2 cables west-south-westward and one cable eastward of Punta Marloca. 25

The eastern side of the harbour is formed by two so-called islands, Isla Grossa (*Lat.* 38° 54' N., *Long.* 1° 27' E.) and Isla Plana, 138 and 65 feet (42^m1 and 19^m8) high, respectively.

Isla Grossa is situated with Cabo de Fora, its southern extremity, about $8\frac{1}{2}$ cables eastward of Punta Marloca, and Cala Talamanca is 30 entered between the island and Cabo Martinet, about one mile north-eastward. Cala Talamanca is an exposed bay the inner part of which is shoal and the land at its head is low. On the south-western side of Isla Grossa and joined to it by a causeway, is an islet named Botafoch.

A light is exhibited, at an elevation of 121 feet (36^m9), from a grey, 35 stone tower, with a white cupola, attached to a dwelling, 69 feet (21^m0) in height, situated on the summit of Botafoch.

Isla Plana, northward of Isla Grossa, is connected with it by a causeway, and is joined to the mainland by a low isthmus.

The harbour is divided by a mole, which extends about $1\frac{1}{2}$ cables 40 north-eastward from the north-eastern extremity of the promontory on the western side, into an outer and an inner harbour.

The head of the harbour is encumbered with shoal flats, the southern edge of which is marked by a conical light-buoy, painted black and exhibiting a *green flashing* light, *every three* seconds, and by the black 45 conical buoys.

A light is exhibited, at an elevation of 46 feet (14^m0), from a conical tower, with a grey cupola, 23 feet (7^m0) in height, situated on the head of the mole.

Anchorage.—Directions.—There is anchorage in the outer har- 50 bour sheltered from all but south-easterly winds, in depths of from 5 to 8 fathoms (9^m1 to 14^m6), weed.

In 1945, an area in the inner harbour, the limits of which are indicated by pecked lines on the chart, had been dredged to a depth of

Chart 3277, plan of Puerto de Ibiza.

20 feet (6^m1). In this area vessels must either make the stern fast to the mole or secure head and stern. Local knowledge is essential.

Puerto de Ibiza should be approached either between Isla Grossa 5 and Los Dados, or between the latter and Islotes Malvins.

Port facilities.—Communications.—Small quantities of fresh provisions can be procured. There is a hospital. Water is laid on to the mole.

There is regular steamer communication with Spain and with other 10 islands in the group.

Chart 3276.

Northern part of the eastern side of Ibiza.—Submarine cable.—

Cabo Llibrell, which rises to an elevation of 728 feet (221^m9), is a whitish cliff, about 3 miles north-eastward of Cabo Martinet, and close 15 off it is an islet.

Cala Longa, on the northern side of Cabo Llibrell, is free from dangers and has a sandy beach at its head.

Punta Rotja (*Lat. 38° 57' N., Long. 1° 32' E.*), the northern entrance point of Cala Longa, is whitish in colour.

20 Rio de Santa Eulalia flows into the sea about 1½ miles northward of Punta Rotja, and the coast between them consists of cliffs gradually decreasing in height to the mouth of the river.

Ensenada de Santa Eulalia is entered between the mouth of Rio de Santa Eulalia and Punta Arabi, about 2½ miles east-north-eastward.

25 On the northern side of the bay, about 1½ miles westward of Punta Arabi, is a cliffy point, and between these two points is a cove with reefs in its approach; the shore eastward of the cove is foul for about 2 cables offshore.

Punta Arabi is a low, dark, salient point, and between it and Cabo 30 Roig, about 3 miles north-eastward, are some unimportant coves, close off the south-westernmost of which are some above-water rocks, 8 feet (2^m4) high.

Cabo Roig, the eastern extremity of Ibiza, is a grey cliff, with reddish patches, 453 feet (138^m1) high.

35 Punta des Valls, about half a mile northward of Cabo Roig, is surmounted by a tower, 30 feet (9^m1) in height, the top of which is at an elevation of 249 feet (75^m9).

Cala del Lleo, at the head of a bay between Punta des Valls and Punta del Lleo, about 7 cables north-westward, is only available to 40 boats and there are some rocks in its approach.

Playa del Figueral is a beach between Punta del Lleo and Port de la Cala, about 2 miles north-north-westward; it is partly sandy and in part rocky. There are several above-water rocks and islets close off this beach, of which Isleta del Hort and Escollo Negres are the 45 most important.

Port de la Cala or Cala de San Vicente is a cove on the south-western side of the projection of which Punta Grossa, *see* page 164, is the north-eastern extremity. A submarine telegraph cable, *see* page 19, the route of which is indicated by a pecked line on the chart, 50 is landed at Port de la Cala.

Off-lying islets and dangers.—Light.—Islotes Lladós are two steep-to islets, 33 and 20 feet (10^m1 and 6^m1) high, respectively, lying half a mile offshore, about one mile east-north-eastward of Cabo Martinet.

Charts 1187, 2158a.

Chart 3276.

Islas de Santa Eulalia are four in number. The largest, named La Grande, or Santa Eulalia, is 121 feet (36^m9) high, and lies about one-quarter of a mile south-south-eastward of Punta Arabi. La Redona, about 2 cables south-westward of La Grande, is 72 feet (21^m9) high, and is foul on its eastern and southern sides. El Morenallet lies about 3 cables north-westward of La Redona, and El Caragolet lies 2 cables offshore, about one-quarter of a mile farther north-westward. The passages between the islets, or between them and the coast, should not be attempted without local knowledge; there is no passage between El Caragolet (*Lat.* 38° 59' N., *Long.* 1° 34' E.) and the coast.

Losa de Santa Eulalia, with a depth of less than one fathom (1^m8), lies about three-quarters of a mile south-eastward of La Grande, and is usually marked by breakers.

Isla de Tagomago, 374 feet (114^m0) high, is situated eastward of 15 Punta des Valls, from which it is separated by a deep channel, free from dangers, about three-quarters of a mile wide. With the exception of a very small islet close off its northern side, the islet is steep-to. In its northern side are two coves, and there is one on its southern side. The northern side of this island is low and rocky, but its southern side is high and cliffy. 20

A light is exhibited, at an elevation of 256 feet (78^m0), from a grey octagonal tower surmounting a grey rectangular dwelling, 49 feet (14^m9) in height, situated on the south-eastern extremity of Isla de Tagomago. 25

Losa del Figueral, awash, lies on a small detached shoal, about 6 cables east-north-eastward of Isleta del Hort. The light on Isla de Tagomago is obscured over this danger between the bearings 047° and 131°.

Anchorage.—Ensenada de Santa Eulalia affords sheltered anchorage with offshore winds, to vessels with local knowledge; the best berth is close inshore off the cove in its northern part. 30

Port de la Cala affords sheltered anchorage to vessels with local knowledge, except with south-easterly winds. This cove is free from dangers, but care must be taken to avoid the submarine telegraph cable. 35

Chart 1317.

MAJORCA.—**General remarks.**—Majorca, called by the Spanish Mallorca, is the largest of Islas Baleares. It is situated north-eastward of Ibiza, from which it is separated by a deep channel nearly 45 miles wide, *see* chart 1187. 40

The north-western coast of the island is nearly straight, and on this side the mountains attain their greatest elevation, Puig Mayor, about 2 miles inland of the middle of it, rising to an elevation of 4,741 feet (1,445^m1); elsewhere the coast is lower and rocky, with but few beaches. 45

There are no outlying dangers, and the island, as well as the few islets off it, is steep-to.

Trade. — Production. — The principal exports are:—clothing, cotton, wood, shoes, rubber, furniture, glassware, and costume jewellery. The chief imports are:—Coal, hardware, petroleum products, wheat, flour, and timber. 50

The chief products are:—Fruit, beans, potatoes, olive oil, pigs and cement.

Charts 1187, 160, 2158a.

Chart 1317.

There is an active fishing industry.

Chart 2394.

Isla de Cabrera.—Light.—This rugged and hilly island belongs to the Ministry of War, and permission must be obtained from the Military authorities to visit it; it is situated about $7\frac{1}{2}$ miles south-westward of Punta Salinas, the southern extremity of Majorca, *see* chart 1317, and its coasts are in most places steep-to.

Punta Anciola, the south-western extremity of the island, is the extremity of a small peninsula, 394 feet (120^m1) high.

A light is exhibited, at an elevation of 387 feet (118^m0), from a light yellow tower and dwelling, 72 feet (21^m9) in height, situated on Punta Anciola.

Punta del Coll Roig lies about half a mile north-north-westward of Punta Anciola, and between them is a cove, divided into two parts by a narrow point named Punta del Mitx. Isote de las Ratas, 46 feet (14^m0) high, lies close inshore on the south-eastern part of the cove.

Punta Picamoscas (*Lat.* 39° 09' N., *Long.* 2° 55' E.), about 3 cables northward of Punta del Coll Roig, is a high cliff, close to the foot of which lies an islet surrounded by reefs. Above the cliff, a hill named Picamoscas rises to an elevation of 564 feet (171^m9), and is the highest in the island. *See* view on chart 2394.

Cabo Labeche, the north-western extremity of the island, rises to a detached hill 197 feet (60^m0) high. This cape is situated about one mile northward of Punta Picamoscas, and between them are a number of coves. From the cape the coast trends about half a mile south-south-eastward to the entrance of Puerto de Cabrera, *see* page 169.

Punta de la Creueta, the eastern entrance point of Puerto de Cabrera, lies about $6\frac{1}{2}$ cables south-eastward of Cabo Labeche, and above it stand some prominent buildings.

Punta Xurigué lies about $3\frac{1}{2}$ cables east-north-eastward of Punta de la Creueta, and Cala Ganduf is entered between Punta Xurigué and Punta de la Cueva Azul, about three-quarters of a mile north-eastward.

Cala Ganduf should not be used as an anchorage, as it is exposed to north-westerly winds, and easterly ones send in a heavy sea.

Cabo Moroboti, the northern extremity of Isla de Cabrera, lies about 2 cables east-north-eastward of Punta de la Cueva Azul, and from it the coast trends about $1\frac{1}{2}$ miles east-south-eastward to Cabo Ventoso; this stretch of coast is rugged and indented, and its eastern part is foul for a short distance offshore.

Cabo Ventoso is a steep-to, cliffy headland, 348 feet (106^m1) high, and is the north-eastern extremity of Isla de Cabrera.

Cabo de la Olla lies about three-quarters of a mile south-south-westward of Cabo Ventoso, and the coast between them is high, cliffy, and steep-to.

Punta de la Isla de Sas Blas lies about half a mile south-south-westward of Cabo de la Olla, and between them is an open bay, close to the shore of which are some islets.

Isla de Sas Blas, 23 feet (7^m0) high, lies close inshore about one cable southward of Punta de la Isla de Sas Blas.

Ensenada Codolá del Imperial is entered between Punta Isla des Baxell, about 2 cables south-south-westward of Isla de Sas Blas, and Punta Imperialet, about half a mile farther southward.

Charts 1187, 160, 2158a.

Chart 2394.

Islote Imperial, 217 feet (66^m1) high, is steep-to, and lies off the coast southward of Punta Imperialet, from which it is separated by a channel, about half a cable wide, with depths of 6 fathoms (11^m0) at the northern end. 5

Cabo Falcó, the southern extremity of Isla de Cabrera, lies about one-quarter of a mile south-westward of Punta Imperialet.

From Cabo Falcó the coast trends about 1½ miles westward to Punta Anciola, and in it are some coves, only available to small craft with local knowledge. 10

Islotes Estells are five rocky islets lying within half a mile of the middle of the southern coast of Isla de Cabrera. Estells de Fuera, the two outer islets, are steep-to on all sides. Estells Xapats are the three inner islets, and the centre one is 144 feet (43^m9) high; of these, the two western islets are steep-to, but the passage between the eastern 15 islet and the coast is foul.

Puerto de Cabrera.—Morro Niu de S'Aguila, on the western side of the approach to Puerto de Cabrera, is clifty, and 358 feet (109^m1) high; it is situated about 4 cables south-south-westward of Cabo Lebeche (*Lat.* 39° 09' N., *Long.* 2° 55' E.), *see* page 168. 20

Punta del Castillo lies about 2 cables south-south-eastward of Punta de la Creueta, the eastern entrance point of Puerto de Cabrera. Close north-eastward of the former point the ruins of a castle stand at an elevation of 308 feet (93^m9). These two points should not be approached closely as there are depths of 4½ and 3½ fathoms (8^m2 and 25 6^m4), respectively, a short distance from them.

Punta des Llanegay lies on the western side of the entrance to the harbour about one-quarter of a mile south-south-eastward of Morro Niu de S'Aguila, and the shore northward of the point is high, clifty and steep-to. 30

Within the harbour are several shallow coves, and at the head of one of them there is a landing place. There is another landing place about 1½ cables eastward of Punta del Castillo.

Anchorage.—Puerto de Cabrera affords secure anchorage to vessels of moderate size. The best berth to obtain shelter from northerly winds is in the eastern part of the harbour, in depths of about 8 fathoms (14^m6), sand and weed, about 2 cables south-eastward of Punta del Castillo. 35

Reus de Cabrera.—Dangers.—Light.—Between the northern end of Isla de Cabrera and Punta Salinas, *see* page 168, is a channel in the southern part of which are some islets with navigable passages between them. 40

Isla Redonda, about half a mile northward of Cabo Ventoso, is 184 feet (56^m1) high, and steep-to, except on its south-western side; its north-eastern side is clifty and inaccessible. 45

Isla Conejera is situated with Punta del Escull Sota-aigat, its south-eastern extremity, about half a mile north-westward of Isla Redonda. On its eastern side, a hill above some cliffs, named El Blanqué, rises to an elevation of 400 feet (121^m9). Along the eastern coast are several coves only available to small craft with local knowledge. 50

Escull Sota-aigat, close off Punta del Escull Sota-aigat, is foul for a short distance offshore, as is the whole of the eastern coast of the island.

Escull de la Escala is an above-water rock close off the western extremity of the island.

Charts 1317, 1187, 160, 2158a.

Chart 2394.

Bajo de Cala Estreta is a detached rocky shoal, with a depth of about one foot (0^m3), lying within three-quarters of a cable of the middle of the northern side of the island.

- 5 Isla Esponja is a steep-to, almost inaccessible, islet, 75 feet (22^m9) high, lying about 3 cables northward of the middle of the northern side of Isla Conejera.

Isla Plana, 72 feet (21^m9) high, lies about one-quarter of a mile east-north-eastward of Isla Esponja, with a shoal bank extending for
10 a short distance from its southern side.

Isla Pobre, 79 feet (24^m1) high, lies about one cable northward of Isla Plana, with depths of not more than 5 fathoms (9^m1) between. An islet lies close north-eastward of Isla Pobre, and in the narrow channel between there is an above-water rock.

- 15 Isla Horadada, about 3½ cables north-north-eastward of Isla Pobre, is 89 feet (27^m1) high, and is almost inaccessible. Close southward of Isla Horadada is an islet, and there is an above-water rock situated on foul ground between.

A stony bank, with depths of 4 fathoms (7^m3), extends about half
20 a cable southward of the islet.

A light is exhibited, at an elevation of 83 feet (25^m3), from a tower, the lower part of which is circular and the upper part conical, situated on the northern side of Isla Horadada (*Lat.* 39° 12' N., *Long.* 2° 59' E.).
Chart 1317.

- 25 Freu de Cabrera, between Isla Horadada and Punta Salinas, is nearly 5 miles wide and, being free from dangers, is to be preferred to the narrow passages between the islets described above.

Strong east-going or west-going currents are experienced in all the channels according to the direction of the prevailing wind.

- 30 **Southern side of Majorca.—Dangers.—Light.**—Punta Salinas is low and is backed by gently sloping land, on which, about 7 cables north-eastward of it, is Torre de Gosta, with its top at an elevation of 210 feet (64^m0). Punta Salinas is fringed by a shoal bank extending about one cable offshore.

- 35 A light is exhibited, at an elevation of 56 feet (17^m1), from a grey circular tower, 33 feet (10^m1) in height, attached to a white dwelling, situated on Punta Salinas.

Punta de Campos lies about 4 miles north-westward of Punta Salinas, and between them the coast is low and rocky in places. In the northern
40 part of this stretch of coast is a bay, encumbered with islets and shoals, and in the northern corner of the bay is a boat harbour, named Puerto de Campos. Torre de Campos, the top of which attains an elevation of 59 feet (18^m0), stands on Punta de Campos.

- Isla Corberana, with a depth of 4½ fathoms (8^m2) close to its
45 southern side, lies within one-quarter of a mile westward of Punta de Campos.

Punta Plana is a low point, with an above-water rock close off it, situated about 4½ miles north-westward of Punta de Campos, and between them is Ensenada de la Rápita. The shore on the south-
50 eastern side of this bay is foul, and close off it lie some islets; at the head of the bay are two beaches, separated by a rocky point, 16 feet (4^m9) high.

Torre de la Rapida, the top of which attains an elevation of 59 feet (18^m0), stands on the shore about 2 miles eastward of Punta Plana.

Charts 1187, 160, 2158a.

Chart 1317.

Puig de Randa rises to an elevation of 1,801 feet (548^m9), about 10 miles northward of Punta Plana.

Punta Vallgornera lies about 1½ miles north-westward of Punta Plana, and the coast between them is foul for a short distance offshore. 5
Torre de la Estalella surmounts a small point about half a mile north-westward of Punta Plana.

Cala Pi is the north-eastern of two coves situated about 2 miles westward of Punta Vallgornera, and the intervening coast is low and rocky. On the eastern side of the entrance of Cala Pi is an old watch 10
tower. From the south-western of the two coves, the coast trends about three-quarters of a mile westward to Punta Taronges, and is high, steep-to, and cliffy.

Chart 2428.

Bahia de Palma.—Dangers.—Lights.—This bay is entered 15
between Cabo Blanco and Punta de Cala Figuera, about 13½ miles north-westward.

Cabo Blanco lies about 1½ miles west-north-westward of Punta Taronges, and between them is Ensenada del Carril. The cape is easy to identify for, in addition to the lighthouse, it is faced with white precipices. 20
It is steep-to, and off it heavy squalls are sometimes experienced with north-easterly winds.

A light is exhibited, at an elevation of 312 feet (95^m1), from a grey square tower and dwelling, 36 feet (11^m0) in height, situated on Cabo Blanco (*Lat.* 39° 22' N., *Long.* 2° 47' E.). 25

Punta de Cala Figuera is cliffy, 69 feet (21^m0) high and steep-to, with the exception of a small reef at the foot of the cliffs on which the sea breaks.

A light is exhibited, at an elevation of 115 feet (35^m0), from a yellow tower, 46 feet (14^m0) in height, situated on Punta de Cala 30
Figuera.

Cabo Enderrocat, about 7½ miles north-north-westward of Cabo Blanco, is surmounted by a tower. The shore between these capes is fairly steep-to and consists of high, flat-topped, whitish cliffs. Near the middle of this stretch of coast is Punta dels Canets. 35

Republicans is a village situated near the northern end of the cliffs which extend about 2 miles northward from Cabo Enderrocat.

Arenal del Sur is a beach extending about 2½ miles north-north-westward from Republicans and terminating near Punta Galera; it is backed by trees and fronted by a shoal bank extending about half 40
a mile offshore. Islote Galera, 25 feet (7^m6) high, lies close westward of Punta Galera, and a rock, with a depth of about one foot (0^m3), on which the sea breaks, lies close south-westward of it.

Torre d'en Pau stands on a point about one mile north-westward of Islote Galera, and from it the shore, which is fringed by a shoal bank 45
extending about 3 cables offshore, trends about 2 miles north-westward to the city of Palma.

Cala de Portichollet and Cala de Portichol, which are suitable for boats only, are entered between Torre d'en Pau and the city.

Cabo Falcó lies about 1½ miles north-north-eastward of Punta de 50
Cala Figuera; between them the shore is high and rocky, and in it are several coves. On Punta de S'Estaca, about midway between the capes, stands an old watch tower.

Isla del Sech is a low, flat islet, about half a mile south-south-eastward

Charts 1187, 160, 2158a.

Chart 2428.

of Cabo Falcó, with depths of from 5 to 10 fathoms (9^m1 to 18^m3) between it and the shore.

Bajo del Sech, with a depth of 2 fathoms (3^m7), lies about one-quarter of a mile north-north-eastward of Isla del Sech.

Ensenada de la Porrassa is entered between Cabo Falcó and Punta de la Porrassa or Torre Nova, about $1\frac{1}{2}$ miles north-north-eastward. Isla de la Porrassa lies in the entrance to Ensenada de la Porrassa.

This islet is 116 feet (35^m4) high, and is steep to on its eastern side; but there is a depth of $3\frac{1}{2}$ fathoms (5^m9) between the shoal bank extending north-westward from the islet and that extending from the head of Ensenada de la Porrassa.

Isla d'en Salas lies close inshore about $1\frac{1}{2}$ miles north-eastward of Punta de la Porrassa, and between them the shore consists of sandy beaches alternating with rocky points.

Las Isletas consist of three rocky islets lying close inshore about three-quarters of a mile eastward of Isla d'en Salas. The middle one is connected with the shore; depths inshore of the others are shoal.

Ensenada de Cala Mayor is entered between Las Isletas and Punta de San Carlos, about $1\frac{1}{2}$ miles east-north-eastward. It is free from dangers and in it are several coves. On the shore of this bay is a cable hut at which submarine telegraph cables, *see* page 19, are landed.

Chart 3036, plan of Palma.

Palma and approaches. — Danger. — Lights. — Buoyage. —

Punta de San Carlos is high and cliffy, and on it is a castle and a fort.

A breakwater is under construction, which will extend about $1\frac{1}{2}$ miles eastward of Punta de San Carlos. In 1948, a length of about $1\frac{1}{2}$ cables had been completed. A cylindrical light-buoy, surmounted by a framework structure and exhibiting a *red flashing* light, showing *forty-five* flashes *every minute*, is moored about 55 yards (50^m3) from the extremity of the completed portion of the breakwater and is moved as the work progresses.

Puerto Pi, on the northern side of Punta de San Carlos, is a shallow cove in which there is a mole, with a depth of 10 feet (3^m0) alongside its head.

A light is exhibited, at an elevation of 131 feet (39^m9), from a grey stone tower, 125 feet (38^m1) in height, situated on the southern entrance point of Puerto Pi (*Lat. $39^{\circ} 33' N.$, Long. $2^{\circ} 37' E.$*).

Torre Pelaires stands on the northern entrance point of Puerto Pi, and between that point and Punta del Terreno, about 4 cables northward, the shore is fronted by a shoal bank, with depths of less than 3 fathoms (5^m5), which extends to Bajo del Corp Mari.

Bajo del Corp Mari, with a depth of $1\frac{1}{2}$ fathoms (3^m2), lies about $2\frac{1}{2}$ cables north-eastward of Torre Pelaires, and is marked on its south-eastern side by a red spherical buoy, surmounted by a cylinder.

El Terreno is a suburb, close northward of Punta del Terreno, standing on the slope of a hill crowned by Castillo de Bellver; the highest tower of this castle attains an elevation of 459 feet (139^m9) and is close northward of the main building, to which it is attached by a flying buttress. Landing can be effected at Muelle de la Pedrera, close southward of the lazaretto, about $1\frac{1}{2}$ cables northward of Punta del Terreno.

The city of Palma, with the suburb of Santa Catalina on its western side, is situated at the head of Bahia de Palma, about one mile north-

Charts 1317, 1187, 160, 2158a.

Chart 3036, plan of Palma.

eastward of El Terreno, and its cathedral, at the western end of which there are two short spires, is exceptionally large and easy to identify. A British Consular officer resides in the city. In 1947, the population was about 136,000. 5

The harbour at Palma is protected on its south-eastern side by Dique Levante, which is connected with the railway system, and extends about 6 cables south-westward from the shore near the cathedral.

Dique Levante is divided into three sections. Muelle Viejo, the 10 innermost section Muelle Nuevo and Prolongacion du Muelle Nuevo; in 1949 work was in progress extending Prolongacion du Muelle Nuevo southward.

A light (*Lat. 39° 34' N., Long. 2° 38' E.*) is exhibited, at an elevation of 59 feet (18^m0), from a grey, octagonal tower on a circular building, 15 36 feet (11^m0) in height, situated on the head of Prolongacion du Muelle Nuevo.

On the north-western side of the mole are three short spurs forming two basins, and on the north-westernmost spur, named La Consigna, are the Health and Port offices. 20

Six lights are exhibited, each at an elevation of 13 feet (4^m0), from a grey column, 13 feet (4^m0) in height, situated one at the north-eastern and one at the south-western corners of each of the three spurs.

At the head of the harbour is a basin, only available to vessels of light draught, that is entered between La Consigna and Punta del 25 Mollet, about three-quarters of a cable northward. Westward of this basin there is a yacht harbour.

There are depths of from 14 to 28 feet (4^m3 to 8^m5) in the south-eastern part of the harbour; the north-western part is shallow, and is reserved for aircraft. 30

Vessels secure, heading north-westward, with two anchors down, and their sterns secured to the mole.

Northerly winds lower the level of the water in the harbour, and southerly ones raise it.

Very heavy north-westerly squalls are sometimes experienced. 35

Anchorage.—**Pilotage.**—Pilotage, *see* page 20, is compulsory for vessels entering the harbour.

A vessel unable to enter the harbour can obtain anchorage in Rada de Palma, southward of the harbour. A good berth is south-eastward of the lazaretto, in a depth of about 8 fathoms (14^m6). A more 40 sheltered position is, in a depth of about 5 fathoms (9^m1), with the lazaretto in line with Castillo de Bellver, bearing 295°, and the cathedral bearing 061°, or as close to the lazaretto on this bearing as the draught of the vessel will permit. Winds from southward and south-westward, which are frequent in winter, raise a considerable sea, though the 45 southerly ones are of shorter duration and of less frequency than the south-westerly ones. The swell is often felt before the wind which causes it. There are several mooring buoys on the roadstead.

Port facilities.—**Communications.**—Supplies can be obtained, but fresh meat is not plentiful. Water is laid on to the quays or can 50 be supplied by water-boats. Minor repairs can be executed. There are several cranes. Moderate stocks of coal and fuel oil are maintained. For deratisation, *see* page 22. There are several hospitals.

There is regular steamer communication with Spain and with other

Charts 2428, 1317, 1187, 160, 2158a.

Chart 3036, plan of Palma.

ports in Islas Baleares. There is air communication with Barcelona, Valencia and Madrid. For radio communication, *see* page 21.

Life-saving.—A lifeboat is stationed and life-saving appliances are 5 maintained at Palma. *See* page 15.

Climatic table.—*See* page 51.

Chart 2428.

South-western side of Majorca.—**Dangers.**—**Light.**—Morro d'en Feliu, 160 feet (48^m8) high, lies about one mile west-north-westward 10 of Punta de Cala Figuera, and between it and Punta de Sas Barbinas, a very narrow projection, about the same distance farther west-north-westward, is Cala Refeubeitx.

Cala Refeubeitx is an open bay on the cliffs at the head of which stands Torre Refeubeitx, at an elevation of 538 feet (164^m0).

15 El Toro, about 3 cables south-westward of Punta de Sas Barbinas, is an islet 95 feet (29^m0) high. It is steep-to on its south-western side, and between it and the point are three other islets, the largest and central one of which is named Banco de Ibiza. The narrow passage between Banco de Ibiza and the islet south-westward of it is shallow.

20 A light is exhibited, at an elevation of 46 feet (14^m0), from a white octagonal tower situated on El Toro.

Cala de Peñas Rojas, about 1½ miles northward of Punta de Sas Barbinas, is small and much encumbered with shoals.

25 Isla Malgrats, 197 feet (60^m0) high, lies about one mile north-westward of Punta Enguixa, the north-western entrance point of Cala de Peñas Rojas. The island is clifty and its south-western end is steep-to.

Isla de los Conejos lies close off the north-eastern extremity of Isla Malgrats. A shoal bank connects the two islands, and on the eastern side of Isla de los Conejos there is a rock, awash.

30 Cabo Malgrats, 157 feet (47^m8) high, is situated about one cable northward of Isla de los Conejos. A tower stands on this cape and close off it lies an islet, the passage between which and Isla de los Conejos is only available to small craft with local knowledge.

Ensenada de Santa Ponza is entered between Isla Malgrats and Cabo 35 Andritxol (*Lat. 39° 31' N., Long. 2° 25' E.*), about 2 miles north-north-westward; it is free from dangers except within short distances of its head and the inner part of its northern side.

40 Cala de Santa Ponza and La Caleta, close southward of it, are two coves in the south-eastern corner of Ensenada de Santa Ponza, the heads of which are shoal. A submarine telegraph cable, *see* page 19, the route of which is indicated by a pecked line on the chart, is landed at the head of Cala de Santa Ponza.

Punta del Castillo, the northern entrance point of Cala de Santa Ponza, can be identified by a tower standing on the slope above it at 45 an elevation of about 150 feet (45^m7).

Punta de la Guarda, about one mile north-north-westward of Punta del Castillo, is easily identified for it separates two beaches.

Punta de la Cerdana is a whitish, clifty point near the middle of the northern shore of Ensenada de Santa Ponza, and on its north-eastern 50 side is a cove, named Puerto de Paguera, but known locally as Cala Fornell.

Cabo Andritxol is a steep-to, reddish, clifty headland, 587 feet (178^m9) high. A watch tower surmounts a hill, 521 feet (158^m8) high, about 4½ cables north-eastward of the cape.

Charts 1317, 1187, 160, 2158a.

Chart 2428.

Cala de Camp de Má is a cove in the north-eastern corner of a bay which is entered between Cabo Andritxol and Punta d'en Ferrá, about 7 cables west-north-westward. Isla de Camp de Má lies in Cala de Camp de Má and landing can be effected at the head of a cove between this island and Punta d'en Ferrá. 5

Cabo Llamp, 725 feet (221^{m0}) high and covered with pine trees, lies about 9 cables west-south-westward of Punta d'en Ferra. Escull d'en Rom, an above-water rock, lies close off this cape.

La Mola de Andraitx, about one mile north-westward of Cabo Llamp, is a peninsula about 330 feet (100^{m6}) high. Its seaward sides are faced with cliffs, and on its summit stands a watch tower at an elevation of about 300 feet (91^{m4}). Between Cabo Llamp and La Mola de Andraitx is a bay in which are Cala Llamp and Cala Marmasen, which are separated by a cliffy headland about 200 feet (61^{m0}) high. 15

Islote S'Aguilot, about 50 feet (15^{m2}) high, lies close off the middle of the north-western side of La Mola de Andraitx.

Punta de na Moragues lies about half a mile northward of Morro d'en Domingo, the north-western extremity of La Mola de Andraitx, and Puerto de Andraitx, *see* below, is entered between them. 20

Punta Galinda lies about 1½ miles north-westward of Punta de na Moragues and the coast between is rocky and indented.

Anchorage.—Ensenada de Santa Ponza affords anchorage, sheltered from winds from north-west, through north, to north-east, but care must be taken to avoid the submarine telegraph cable, *see* page 19. Small craft, with local knowledge, can obtain shelter from westerly winds in Puerto de Paguera in a depth of about 5½ fathoms (10^{m1}). 25

Anchorage can be obtained, with offshore winds, in the bay between Cabo Andritxol and Punta d'en Ferrá. 30

Small vessels, with local knowledge, can obtain anchorage, sheltered from north-easterly winds in Cala Marmasen.

Puerto de Andraitx.—**Dangers.**—**Lights.**—This small harbour (*Lat.* 39° 32' N., *Long.* 2° 23' E.) is situated at the head of a cove and is protected by two breakwaters. 35

Punta de Ballesteria lies about 2½ cables south-eastward of Punta de na Moragues. The outer breakwater extends about three-quarters of a cable from a position on the northern side of the cove about 2½ cables eastward of Punta de Ballesteria. 40

A light (*Lat.* 39° 32' N., *Long.* 2° 23' E.) is exhibited, at an elevation of 39 feet (11^{m0}), from a light-coloured, circular, stone tower, 30 feet (9^{m1}) in height, situated on the head of the outer breakwater.

Bajo Sas Caixes, with a depth of 5½ fathoms (9^{m6}), rock, lies about three-quarters of a cable southward of the head of the outer breakwater, and there are depths of less than 3 feet (0^{m9}) close to the face of this breakwater. 45

The inner breakwater extends about three-quarters of a cable north-westward from a position on the southern shore of the cove, near the village, about 4 cables eastward of the outer breakwater. 50

A light is exhibited from a metal column, 11 feet (3^{m4}) in height, situated on the head of the inner breakwater.

Two shoals, with depths of about one fathom (1^{m8}), rock, lie about three-quarters of a cable westward and north-westward, respectively,

Charts 1317, 1187, 160, 2158a.

Chart 2428.

of the head of the inner breakwater; and two rocky spits, with depths over their extremities, respectively, of $1\frac{1}{2}$ fathoms (2^m3) and less than one fathom (1^m8), extend from the northern shore to positions
 5 about $1\frac{1}{2}$ cables west-north-westward and half a cable north-north-westward of the head of the inner breakwater.

A channel, about half a cable wide, with a least depth in it of $3\frac{1}{2}$ fathoms (5^m9), leads between the above-mentioned dangers, and is marked by one black buoy on its southern, and two red buoys on its
 10 northern side. These buoys are liable to drag out of position.

Anchorage.—Pilots, *see* page 20, are available.

Anchorage can be obtained, in depths of from $2\frac{3}{4}$ to $4\frac{1}{2}$ fathoms (5^m0 to 7^m8), between the outer breakwater and the westernmost of the red buoys, or in a depth of about $5\frac{1}{2}$ fathoms (10^m1) close east-
 15 ward of the head of the outer breakwater.

Vessels drawing up to 16 feet (4^m9) can secure alongside the north-eastern side of the inner breakwater, except near its root, where only small craft can lie.

Freu de la Dragonera.—**Dangers.**—**Lights.**—This channel separates Isla Dragonera from the western end of Majorca, and in it heavy squalls sometimes descend from the high land.

From Punta Galinda the eastern shore of the channel trends about $1\frac{1}{2}$ miles northward to Punta Galera, and thence about $1\frac{1}{2}$ miles north-eastward to Punta del Fabiolé. In this stretch of coast there are
 25 some coves, which are available to small craft with local knowledge only.

Isla de Pantaleu lies close inshore about three-quarters of a mile northward of Punta Galinda (*Lat.* $39^\circ 34' N.$, *Long.* $2^\circ 21' E.$), and is 95 feet (29^m0) high; close eastward of it there is a beach.

30 Isla Mitjana, 26 feet (7^m9) high, lies $1\frac{1}{2}$ cables offshore, about half a mile north-north-westward of Isla de Pantaleu. In the channel between Isla Mitjana and the coast the depths are not less than $6\frac{1}{2}$ fathoms (11^m9) except quite close to the islet, where there is a depth of $3\frac{1}{2}$ fathoms (5^m9). Two rocky shoals, with depths, respectively, of
 35 $1\frac{1}{2}$ and $2\frac{3}{4}$ fathoms (3^m2 and 5^m0), lie very close together, about one cable north-westward of the northern end of Isla Mitjana.

Cala Embaset, which is entered between Punta Galera and Morro de la Ratjada (Rajada), about three-quarters of a mile north-north-eastward, is easily identified, for on its southern side is a tower. The
 40 coast from the head of the cove to and beyond Punta del Fabiolé consists of high cliffs.

Escull d'en Pujol, a small rock, about 3 feet (0^m9) high, lies less than half a cable offshore, about midway between Morro de la Ratjada and Punta del Fabiolé.

45 Isla Dragonera is situated with Cabo Llebeix, its south-western extremity, about 2 miles west-north-westward of Punta Galinda and Cabo Tramontana, its north-easternmost point, about 4 cables west-north-westward of Punta Galera. It rises near the middle at Single de la Ginavera or de Sa Popie to an elevation of 1,181 feet (360^m0).
 50 The north-western side of the island is steep-to; in the south-eastern side are some coves, in the north-easternmost of which, Cala Lladó, is a small stone landing place.

A light is exhibited, at an elevation of 417 feet (127^m1), from a grey circular tower, 43 feet (13^m1) in height, on the western side of a building

Charts 1317, 1187, 160, 2158a.

Chart 2428.

with a red roof, situated on Cabo Llebeix. There is a tower about one cable south-eastward of the lighthouse.

A light is exhibited, at an elevation of 177 feet (53^m9), from a white circular tower, 36 feet (11^m0) in height, on the northern side of a flat-roofed building, situated on the slope of Cabo Tramontana. 5

Islotes Calafates are a group of rocks, most of which are above water, the remainder having depths of less than 3 feet (0^m9). They lie within 1½ cables of the coast of Isla Dragonera, and from 3 to 7 cables south-south-westward of Cabo Tramontana. 10

The currents in Freu de la Dragonera are irregular, and though there is a deep channel between Islotes Calafates and the rocks north-westward of Isla Mitjana, a vessel passing through the strait is advised to use the narrow channel between Isla Mitjana and the coast of Majorca, for it is free from dangers. 15

Chart 1317.

North-western side of Majorca.—Dangers.—With strong onshore winds, this coast should be given a wide berth, for such winds give rise to a heavy sea off it.

Punta de na Foradada, about 3 miles north-eastward of Punta del Fabiolé, can be identified by a hole which pierces it, and by a tower which surmounts it; close off it is an islet. The coast between Punta del Fabiolé and Punta de na Foradada is high and cliffy. 20

Los Farayons are small and lie, one cable offshore, about three-quarters of a mile north-eastward of Punta de na Foradada. 25

Punta de Son Serralta (*Lat. 39° 41' N., Long. 2° 29' E.*), with an islet close off it, lies about 2½ miles north-eastward of Los Farayons, and between them the coast is high and cliffy.

Llosa de sa Tanca, with a depth of 13 feet (4^m0), lies 1½ cables offshore, about 3½ cables south-westward of Punta de Son Serralta. 30

From Punta de Son Serralta, the high, rugged coast trends about one mile north-eastward to Punta del Verger or Es Puntarró, on which stands a tower. Punta Ferranda lies about 6 cables north-eastward of Punta del Verger, and close eastward of it lies the village of Bañalbufur, which is visible from seaward. Punta S'Aguila (des Corral fals) lies about one mile north-eastward of Punta Ferranda. 35

Peninsula de la Foradada lies about 5½ miles north-eastward of Punta S'Aguila, and in the coast between, which is fringed with rocks, are several coves. The peninsula extends about 3 cables north-westward, and is 272 feet (82^m9) high; it is pierced from side to side by a large hole. 40

Punta Deyá, on which stands Torre Deyá, lies about three-quarters of a mile north-eastward of Peninsula de la Foradada; the point is 164 feet (50^m0) high, and is faced with cliffs.

Punta Pancheta lies about 2½ miles north-eastward of Punta Deyá, and between them the coast forms a bay in which are several unimportant coves. From Punta Pancheta, the coast trends about 7 cables north-eastward to Cap Gros, and is steep-to. 45

Anchorage.—Small vessels, with local knowledge, can obtain anchorage, sheltered from winds between north-east and south, on the south-western side of Peninsula de la Foradada, in a depth of 16 fathoms (29^m3), sand and weed, with the hole in the peninsula bearing 000°, distant about 1½ cables; the anchorage is free from dangers, the few rocks in it lying very close inshore. 50

Charts 1187, 160, 2158a.

Chart 1187, plan of Port Soller.

Puerto de Soller.—Lights.—This harbour, which is liable to silting, is entered between Cap Gros and Punta de la Creu, about one-quarter of a mile eastward. It is backed by mountainous country, and about $1\frac{1}{2}$ miles southward of its head are some conspicuous reddish cliffs, 2,980 feet (908^m3) high, that descend in the slopes from Sierra del Tex, which mountains rise to an elevation of 3,491 feet (1,064^m1), 2 miles inland, and about 4 miles southward of Cap Gros, *see* chart 1317.

10 Cap Gros is a massive promontory, 413 feet (125^m9) high, surmounted by a signal station on the western side of the lighthouse.

A light is exhibited, at an elevation of 387 feet (118^m0), from a grey circular tower, 62 feet (18^m9) in height, attached to a grey rectangular building with a red roof, situated on Cap Gros.

15 Punta de la Creu is the south-western extremity of a small peninsula, on the northern and highest side of which is the hermitage of Santa Catalina.

A light is exhibited, at an elevation of 115 feet (35^m1), from a white, circular tower, 39 feet (11^m9) in height, situated on Punta de la Creu

20 (*Lat. 39° 48' N., Long. 2° 41' E.*).

On the northern side of the harbour, eastward of Punta de la Creu, are two moles, with depths of from 18 to 29 feet (5^m5 to 8^m8) along their eastern sides, and north-eastward of the eastern one is a quay, fronting the village, with depths alongside of from 13 to 18 feet (4^m0 to 5^m5). In 1949, harbour works were in progress.

Two lights are exhibited, at elevations of 22 and 20 feet (6^m7 and 6^m1), respectively, from masts, 16 feet (4^m9) in height, situated one on each of the mole heads.

Three leading lights are occasionally exhibited, which, in line, lead 30 up to the harbour entrance.

The eastern side of the harbour consists of a sandy beach, fronted by a shoal bank, in the southern part of which is the mouth of a stream, with Castillo de Aicater close eastward of it.

Cabo de sa Pared, on the southern side of the harbour, is rocky, and 35 between it and Cap Gros is an indentation at the head of which is the mouth of a stream. On the south-eastern side of Cabo de sa Pared is the lazaretto, at which there is a landing place.

Anchorage.—There are no dangers; the bottom is mostly sand, but there are some large patches of weed, and near the moles it is of 40 mud; the holding ground is fairly good, but secure anchorage can only be obtained by small vessels of moderate draught in the north-eastern part of the harbour, and caution must be exercised, for a heavy swell sometimes enters.

In summer, temporary anchorage can be obtained in fine weather, 45 in depths of 6 or 7 fathoms (11^m0 or 12^m8), close southward of the head of the western mole.

Pilots.—Port facilities.—Pilots, *see* page 20, are available. Supplies can be obtained from the town of Soller, about 2 miles south-eastward of the harbour. There is a 5-ton crane on the quay.

50 *Chart 1317.*

Northern side of Majorca.—Dangers.—Punta Grossa, or Llarga, lies about one mile north-eastward of Punta de la Creu, and on a cliff between them, at an elevation of 518 feet (157^m9), is Torre Picada.

Islote S'Illa, 223 feet (68^m0) high, lies close inshore about half a

Charts 160, 2158a.

Chart 1317.

mile north-eastward of Punta Grossa, and between them is a small bay with a sandy beach at its head.

Punta de Cala Rotja lies about $1\frac{1}{2}$ miles north-eastward of Islote S'Illa, and on the brow of a hill above it stands Torre Seca. 5

Morro del Forat, on which are the ruins of a tower, lies about $1\frac{1}{2}$ miles north-eastward of Punta de Cala Rotja, and between them is Ensenada La Costera, on the shore of which is a prominent building that is brilliantly illuminated at night.

Punta Prima, the north-western extremity of Mola de Tuent, lies 10 about three-quarters of a mile north-eastward of Morro del Forat, and between them is Cala Tuent, with a beach at its head. This beach is the north-easternmost of those on this side of the island, on which it would be possible to effect a landing in bad weather.

Mola de Tuent is 1,512 feet (460^m9) high, and on its summit is a 15 tower. Puig Mayor, or Silla de Torrellas, *see* page 167, is situated about $2\frac{1}{2}$ miles south-south-westward of Mola de Tuent.

Morro de sa Corda is the northern extremity of Mola de Tuent, and Cala de la Calobra is entered between it and Morro de la Vaca, about one mile east-north-eastward. At the head of this cove is the mouth 20 of the largest stream in the island.

Morro de la Vaca is clifty, rises to an elevation of 820 feet (280^m9); between it and Punta Beca, about $7\frac{1}{2}$ miles north-eastward, the coast is barren, rocky, and faced with cliffs. Morrillo de Burdils, surmounted by Torre de Lluch, lies about $1\frac{1}{2}$ miles east-north-eastward of Morro 25 de la Vaca. Morro d'en Llobera, about three-quarters of a mile north-eastward of Morrillo de Burdils, is a spur of Puig Roig, which latter rises to an elevation of 3,291 feet ($1,003^m1$) about one mile eastward of Torre de Lluch.

Punta Beca (*Lat.* $39^\circ 55' N.$, *Long.* $2^\circ 57' E.$) is clifty, reddish in 30 colour, and dominated by mountains.

Cambra de la Señora is a cove about $2\frac{1}{2}$ miles eastward of Punta Beca, and between them is a bay, at the head of which is Punta Ferrayó.

Puig Gros, or de Ternellas, rises to an elevation of 2,750 feet (838^m2), 35 about one mile south-westward of Punta Ferrayó.

Castillo del Rey is a ruin surmounting a prominent, rocky eminence, 1,614 feet (491^m9) high, and almost completely surrounded by cliffs. It stands on the eastern side of Cambra de la Señora, and between it and Punta Topina, about $1\frac{1}{2}$ miles north-eastward, the coast is high 40 and clifty.

Punta de la Galera, 236 feet (71^m9) high, lies about half a mile eastward of Punta Topina.

Cala Estremé is entered between Punta de la Galera and Punta de Covas Blancas, about one mile east-south-eastward. 45

Cala de San Vicente is entered between Punta de Covas Blancas and Punta de la Troneta, a fairly low point about $1\frac{1}{2}$ miles eastward. It has two coves at its head, which are separated by a point surmounted by an old tower. At the head of the western cove, and visible from seaward, is a fishing village. The eastern side of Cala de San Vicente 50 consists of steep cliffs. Landing can be effected in the cove on the eastern side of Punta de la Troneta.

Punta de la Nao lies about three-quarters of a mile eastward of Punta de la Troneta, and close southward of it Atalaya de Albercuitx rises

Charts 1187, 160, 2158a.

Chart 1317.

to an elevation of 1,276 feet (388^m9), with an old tower on its pointed summit. The land eastward of Punta de la Nao forms the low isthmus of Promentorio del Formentor.

- 5 **Promentorio del Formentor.**—**Light.**—This peninsula terminates in Cabo de Formentor; most of its northern side is high and steep. The peninsula is mountainous, El Pal and El Fumat rising to elevations, respectively, of 1,420 and 1,096 feet (432^m8 and 334^m1), about 2 and 3 miles east-north-eastward of Atalaya de Albercuitx. From
10 a distance northward the peninsula appears as a chain of islets, and on nearer approach, on account of its low isthmus, it might be mistaken for an island.

- Islote Colomer, a reddish, cliffy, almost inaccessible islet, 381 feet (116^m1) high, lies close off a low point, about one mile north-eastward
15 of Punta de la Nao.

Cabo Cataluña, about 2½ miles east-north-eastward of Islote Colomer, is a rugged headland, 968 feet (295^m0) high.

- Cala Figuera is entered between Cabo Cataluña and Punta d'en Tomás, about half a mile south-eastward. At the head of this cove
20 is a stony beach, and on the eastern side of its head are some large rocks.

Punta d'en Tomás is high and cliffy, and on its eastern side is a cove which is foul.

- Cabo de Formentor is barren, cliffy and steep-to. *See* views facing
25 page 160.

A light is exhibited, at an elevation of 686 feet (209^m1), from a dark grey tower and dwelling, 69 feet (21^m0) in height, situated on Cabo de Formentor (*Lat.* 39° 58' N., *Long.* 3° 12' E.).

- From Cabo de Formentor the coast trends about half a mile south-
30 ward to El Bancal, and thence about half a mile south-westward to Punta del Vent, near which is a reddish fissure, 564 feet (171^m9) in height.

- South-eastern side of Majorca.**—**Light.**—From Punta Salinas, *see* page 168, the rocky coast, which is indented by several coves,
35 trends about 5½ miles north-eastward to Torre Nova, the top of which is 125 feet (38^m1) high.

- Cala Figuera, about 1½ miles east-north-eastward of Torre Nova, is the fishing harbour of Santany, a town about 2½ miles north-westward of it, in which is a church that is visible from seaward. On the eastern
40 entrance point of the cove is a tower, the top of which is at an elevation of 118 feet (36^m0), and care must be taken to avoid mistaking Torre Nova for it.

- Puerto Petro lies about 2½ miles north-eastward of Cala Figuera, and between them are some coves. This harbour is open south-eastward,
45 and its entrance, in the middle of which there is a depth of about 10 fathoms (18^m3), is about one cable wide; on its western side are three short creeks, and at its head is a muddy beach. Close within the south-western entrance point of the harbour is an old tower; this tower is high and square, and on account of its peculiar construction
50 cannot be mistaken for any of the others along the coast. From a position about 3¾ cables north-north-westward of this tower, a jetty extends about 200 feet (61^m0) east-south-eastward and thence 260 feet (79^m2) east-north-eastward. On the northern entrance point of the northernmost creek stand a few houses. There are depths of 5 fathoms

Charts 1187, 160, 2158a.

Chart 1317.

(9^m1) in the middle of the harbour, and of 2½ fathoms (5^m0) about 1½ cables east-south-eastward of the jetty.

Cala Llonga lies about one mile north-eastward of Puerto Petro, and between them are three coves of no importance. Cala Llonga, 5 with two creeks on its northern side, is open eastward, and on its southern entrance point is an old fort, the highest part of which attains an elevation of 46 feet (14^m0).

From the entrance of Cala Llonga, the coast trends about 3 miles north-north-eastward to Puerto Colom, *see* below, and in it are several 10 coves. Close inshore, about three-quarters of a mile south-south-westward of the lighthouse at Puerto Colom, is an islet 36 feet (11^m0) high.

Puig de San Salvador, about 4½ miles north-westward of the entrance of Puerto Colom, is a conical hill, 1,673 feet (509^m9) high. It is con- 15 siderably higher than the hills surrounding it, and on its summit stands a prominent hermitage. A chapel with a monument and a cross close by are also good marks.

Torre de Cala Manacor, a tower, the top of which attains an elevation of 128 feet (39^m0), is situated about 7½ miles north-north-eastward of 20 the entrance to Puerto Colom, and between them are a great number of coves, of use to fishermen only.

Cala Manacor is entered about a quarter of a mile north-eastward of Torre de Cala Manacor.

A light is exhibited, at an elevation of 66 feet (20^m1), from a masonry 25 tower, 18 feet (5^m5) in height, situated on the southern entrance point of Cala Manacor.

Punta Rasa lies about 2 miles north-eastward of Torre de Cala Manacor, and close north-north-eastward of this point is Cala Morlanda.

Punta de na Moreya lies about one mile north-north-eastward of 30 Punta Rasa, and close northward of it is an islet. Close north-westward of Punta de na Moreya is the mouth of Torrente de Son Amer, which forms a lagoon separated from the sea by a sandy beach.

Anchorage.—Puerto Petro affords anchorage to small vessels, with local knowledge, in depths of from 4½ to 5½ fathoms (7^m8 to 10^m1), 35 with the stern secured to the western shore, but there is only room for one or two vessels at a time; small craft can anchor farther up the harbour, but the depths shoal suddenly to 5 feet (1^m5).

Cala Llonga affords anchorage to small vessels, with local knowledge, in depths of from 3½ to 4½ fathoms (6^m9 to 7^m8). 40

Puerto Colom.—**Light.**—The entrance of this small harbour faces southward, and is about one cable wide. On the eastern entrance point stands a lighthouse which is obscured by higher land when bearing less than about 225°. About one cable north-eastward of the lighthouse stands a tower, visible from all directions, the top of which attains an 45 elevation of 118 feet (36^m0); on the western entrance point are the ruins of a barracks at an elevation of about 50 feet (15^m2).

A light (*Lat.* 39° 25' N., *Long.* 3° 16' E.) is exhibited, at an elevation of 82 feet (25^m0), from a grey tower, 26 feet (7^m9) in height, attached to a white building with a red roof situated on the eastern entrance 50 point of Puerto Colom.

Within the entrance, on the western side of the harbour, is Ensenada de la Bassa Nova, the depths in which decrease regularly from about 7 feet (2^m1). On the western side of the harbour, northward of this

Chart 1317.

bay, is a wharf, fronting a village, with a small jetty extending from its centre ; the depths alongside the wharf are from 2 to 4 feet (0^m6 to 1^m2), and at the head of the jetty there is a depth of 5 feet (1^m5). At the head of the harbour is another village, in which is a small church.

In the middle of the harbour is a mooring-buoy to which vessels, having anchored in a depth of about 16 feet (4^m9), can secure their sterns. Three small buoys mark the boat-channel leading to the jetty.

No attempt should be made to enter the harbour without local knowledge.

Eastern side of Majorca.—Light.—Punta Amer, about 1½ miles north-eastward of Punta de na Moreya, is low, and on it is an old castle, the highest part of which attains an elevation of 128 feet (39^m0).

Bahia de Artá is entered between Punta Amer and Cabo del Pinar or del Ratx, about 3½ miles north-north-eastward ; it has low land at its head, and its shore there consists of beaches backed by dunes and separated by rocky outcrops. At the head of the bay are several coves, but they are only available to small craft, with local knowledge.

Cabo del Pinar is dark in colour, and is a spur of Sierra de Son Jordi, which latter attains an elevation of 1,033 feet (314^m9) about 1½ miles north-westward of it.

Cala Rotja, into which flows a stream, and Cala de Cañamel, with a beach at its head through which a stream flows, lie between Cabo del Pinar and Cabo Vermey, about 1½ miles north-north-eastward.

Cabo Vermey is reddish, high, barren and cliffy ; *see* view facing page 161. On this cape stand two towers, that nearest to the sea, named Torre de Heretat, being in ruins with its highest part at an elevation of 607 feet (185^m0) ; the top of the other one, named Torre Mascot, is at an elevation of 771 feet (235^m0).

Isla Forana lies about 2½ miles northward of Cabo Vermey, and between them are several coves. This island, from which a reef extends about one-quarter of a cable south-eastward, lies close off the southern entrance point of Cala de Son Moll, the passage between them being foul.

On the shore of Cala de Son Moll stands a hut at the landing place of a submarine telegraph cable, *see* page 19, the route of which is indicated by a pecked line on the chart.

Cala Retjada, about half a mile north-eastward of Cala de Son Moll, has a beach at its head, near which is a village, and Torre Cega (Cela) stands on its north-eastern entrance point.

Capdepera (*Lat.* 39° 42' N., *Long.* 3° 26' E.), a town about 1½ miles west-south-westward of Torre Cega, stands on a hill and is visible from seaward, as are several mills in its vicinity.

Punta del Gat or d'es Farayo lies about half a mile south-eastward of Torre Cega, and close south-eastward of it is an islet, 30 feet (9^m1) high, with a reef on its south-eastern side and an above-water rock on its north-western side. The passage, about half a cable wide, between the islet and the point, is shoal.

Cabo Pera, the eastern extremity of Majorca, lies about half a mile northward of Punta del Gat ; it is reddish, rocky and rises to an elevation of 256 feet (64^m9).

A light is exhibited, at an elevation of 213 feet (64^m9), from a dark grey tower, with a cornice and a square base, surmounting a white dwelling with a red roof, 56 feet (17^m1) in height, situated on Cabo Pera.

Charts 1187, 160, 2158a.

Chart 1317.

Anchorage.—Vessels with local knowledge can anchor in Bahía de Artá, with winds from between south-west and north-west. The best berth is in the northern part of the bay, in depths of from 9 to 14 fathoms (16^m5 to 25^m6), sand and weed. 5

Cala de Cañamel affords shelter to small craft, with local knowledge, but the sea breaks heavily at a considerable distance from the beach with onshore winds.

Cala Retjada affords anchorage to small craft, with local knowledge, during offshore winds, in a depth of about 5½ fathoms (10^m1). 10

Small vessels, with local knowledge, can obtain anchorage, sheltered from westerly, northerly, and north-easterly winds, on the western side of Punta de Gat, in depths of 5 or 6 fathoms (9^m1 or 11^m0).

North-eastern side of Majorca.—Coast.—Dangers.—Punta de na Foguera lies about 1½ miles north-north-westward of Cabo Pera, 15 and the coast between them is rocky and steep-to. This stretch of coast forms a bay in which are several coves; near the middle of the bay, about 3 cables offshore, is Bajo de La Mola de la Aguila, with a depth of 2½ fathoms (4^m6), rock.

Cabo del Freu, about half a mile northward of Punta de na Foguera, 20 is a narrow projection extending north-eastward, and is a spur of Puig Son Jaumel, which rises to an elevation of 889 feet (271^m0) about three-quarters of a mile south-westward of the cape, and is surmounted by a tower. From Cabo del Freu, the coast trends about 2½ miles west-north-westward to Morro de Aubarca, and is steep and of a dark 25 colour; in it are some coves, but none of them is available to any but small craft, with local knowledge. *See* view facing page 161.

Playa de Mesquida is a noticeable beach of white sand between Cabo del Freu and Punta del Buch, about 1½ miles westward.

A shoal, with a depth of 2½ fathoms (4^m1), lies about 4 cables east- 30 ward of Punta del Buch.

A shoal, with a depth of 8 feet (2^m4), rock, lies close off a point about 2 cables south-eastward of Morro de Aubarca.

Morro de Aubarca (*Lat.* 39° 46' N., *Long.* 3° 24' E.) is reddish, cliffy, and surmounted by an old tower, the top of which is elevated 220 feet 35 (67^m1).

El Farayó de Aubarca, an islet 75 feet (22^m9) high, lies about 3½ cables northward of Morro de Aubarca, and the passage between them, in which there is a depth of 11 fathoms (20^m1), is free from dangers.

Cabo Farruch lies about 3 miles north-westward of Morro de Aubarca, 40 and between them are Caleta Font Salada and Arenal d'es Vergé, the latter having a reef in its entrance. Cabo Farruch is free from off-lying dangers, but there are some rocks close to it. From the cape, the land rises steeply, forming a rocky promontory, the summit of which is named Atalaya de Morey. Torre Atalaya de Morey, the top of which 45 attains an elevation of 1,417 feet (431^m9), stands on Atalaya de Morey. From this promontory, ranges of mountains extend south-south-westward and south-eastward, parallel with the coast; the former range attains elevations of 1,844 and 1,706 feet (562^m0 and 520^m0), respectively, at the summits of Alto Morey and Bec de Farruch, about 2 and 50 5½ miles south-south-westward of Cabo Farruch, but the latter mountain is only visible from northward.

Bahía de Alcudia.—Dangers.—Light.—This bay is entered between Cabo Farruch and Cabo Menorca, about 8 miles north-west-

Chart 1317.

ward, and when seen from seaward appears to recede farther than in reality it does on account of the low land at its head.

Punta Farruch lies about half a mile south-westward of Cabo Farruch, and close inshore, a short distance northward of it, is Farayó de Farruch, a rock 23 feet (7^m0) high.

Punta Llarga lies about 4½ miles south-westward of Punta Farruch, and between them the coast, forming the south-eastern shore of Bahía de Alcudia, is low, fringed with rocks close inshore, and cultivated to the foot of the mountains behind it. In it are several coves, but they are available for small craft with local knowledge only.

Isla d'en Porros, 7 feet (2^m1) high, lies close inshore about 3½ miles west-north-westward of Punta Llarga. From abreast Isla d'en Porros the shore trends about 6½ miles north-westward and northward to Puerto de Alcudia, and consists of a beach.

Chart 3149.

The beach at the head to Bahía de Alcudia is fringed by a shoal bank extending a short distance offshore, and close inshore, about 1½ miles west-north-westward of Isla d'en Porros, lies Escuy de Can Barret, a rocky shoal with a depth of 2 feet (0^m6). The beach is backed by extensive marshes, which are drained by a canal, which enters the bay, between two small, rubble breakwaters, about 4 miles north-westward of Isla d'en Porros.

Isla Aucanada is low and rocky. It lies about 3 miles north-eastward of the entrance to the canal, close off Punta Aucanada, with which it is connected by a reef. The islet and the shore on either side of Punta Aucanada are fringed by a shoal bank extending about 1½ cables offshore.

A light is exhibited, at an elevation of 79 feet (24^m1), from a grey, stone tower surmounting a yellow dwelling, 46 feet (14^m0) in height, situated on Isla Aucanada (*Lat.* 39° 50' N., *Long.* 3° 10' E.).

Punta del Castillo is a rocky point situated about one mile westward of Punta Aucanada, and about one cable east-north-eastward of Punta del Castillo stands an ancient tower. The ruins of an old lazaretto are situated about one-quarter of a mile west-north-westward of the tower.

Puerto de Alcudia.—Light.—Light-buoy.—A mole is under construction extending south-westward from Punta del Castillo. In 1950, a length of about 1½ cables had been completed. A can-shaped light-buoy, painted black and exhibiting a *green flashing light every two seconds*, marks the extremity of the extension works.

A mole, with a depth of about 9 feet (2^m7) at its head, extends about one cable from the shore at Caserio del Puerto, about 4 cables north-westward of Punta del Castillo. A light is exhibited, at an elevation of 32 feet (9^m8), from a mast, 29 feet (8^m8) in height, situated on the head of this mole.

The town of Alcudia is situated about one mile north-westward of Caserio del Puerto, but only a part of its walls and some of the higher buildings, amongst which is the prominent church, are visible from the bay.

Life-saving.—Life-saving appliances are maintained at Caserio del Puerto. See page 15.

Anchorage.—Caution.—Bahía de Alcudia is open eastward, but

Charts 1187, 160, 2158a.

Chart 3149.

affords more protection from the gales which originate in the Gulf of Lions, than does Bahía de Pollensa, *see* below.

There is anchorage, in depths of 7 or 8 fathoms (12^m8 or 14^m6), sand and weed, about 9 cables south-westward of Isla Aucanada. 5

Caution must be exercised, for, in 1945, it was reported that the depths in Bahía de Alcudia were from 6 to 10 feet (1^m8 to 3^m0) less than those shown on the chart.

Though not expressly so reserved, the area north-westward of a line drawn south-westward from Punta del Castillo is at times used as an anchorage for seaplanes. 10

Off-lying bank.—Bajo d'els Bachs, with a depth of 7½ fathoms (13^m7), lies about 2 miles east-south-eastward of Cabo Menorca.

Chart 1317.

Coast.—Cabo Menorca is dark, steep-to, and faced with steep cliffs; it is barren at its highest part, though the remainder of it is covered with trees. 15

From Cabo Menorca, the rocky coast trends about 1½ miles northward to Cabo del Pinar, forming a bight.

Cabo del Pinar, *see* view on chart 3149, is a reddish, steep-to, cliffy point, covered with trees, and somewhat lower than Cabo Menorca; from it the land rises to Atalaya de Alcudia, *see* below. 20

Bahía de Pollensa.—**Dangers.**—**Lights.**—This bay lies between Promontorio del Formentor, *see* page 180, and a similar but shorter and wider peninsula, the north-eastern extremity of which is Cabo del Pinar. This bay is entered between Punta Negra, situated about half a mile west-north-westward of Cabo del Pinar, and Punta del Vent, about 3¼ miles northward. 25

Atalaya de Alcudia, on the southern of the two peninsulas, rises to an elevation of 1,490 feet (454^m1), about 1½ miles south-westward of Punta Negra, and is surmounted by a tower. 30

Cap Gros lies about 1½ miles south-westward of Punta Negra, and the coast between them is steep and rocky. On the brow of a hill close southward of Cap Gros is the hermitage of Nuestra Señora de la Victoria. From Cap Gros, the shore trends about three-quarters of a mile south-westward to Punta la Guarda or de Tacarich, forming a bight. 35

Castellet de Cala Murta, on the northern side of the bay, is a small rocky peninsula, 121 feet (36^m9) high, about one mile south-westward of Punta del Vent, and from it the shore trends about 2 miles south-westward, to abreast Isla Formentor, and is steep and rocky. 40

Chart 3036, plan of Pollensa bay.

Punta de Manresa (Lat. 39° 52' N., Long. 3° 08' E.) lies on the southern side of the bay about one mile westward of Punta la Guarda, and on a hillock close southward of it stands an old battery. 45

Bajo del Barcarés, a rock with a depth of less than 6 feet (1^m8), lies about 1½ cables northward of Punta del Emperedó, a flat, barren point about half a mile south-westward of Punta Manresa.

Ensenada del Balcarrés is entered between Punta del Emperedó and Punta del Balcarrés, about 1½ cables westward. This cove is encumbered with rocks, and in it there is a boat harbour. 50

Isla Formentor, on the northern side of Bahía de Pollensa, is 125 feet (38^m1), high and rocky. It lies close off the eastern entrance point of Cala del Pino de la Posada, with which it is connected by a shoal bank.

Charts 1187, 160, 2158a.

Chart 3036, plan of Pollensa bay.

Cala del Pino de la Posada is entered between Isla Formentor and Punta de la Moneya, about three-quarters of a mile westward, and its head is shallow. A rock, with a depth of $4\frac{1}{2}$ fathoms (8^m2), lies about 5 $1\frac{1}{2}$ cables westward of the north-western extremity of Isla Formentor.

Punta de la Avanzada, about $1\frac{1}{2}$ miles south-westward of Punta de la Moneya, has a battery at its extremity, and a small castle, at an elevation of 164 feet (50^m0), on its summit.

A light is exhibited, at an elevation of 79 feet (24^m1), from a grey 10 octagonal tower surmounting a rectangular dwelling, 39 feet (11^m9) in height, situated in the battery on Punta de la Avanzada.,

The head of the bay is bordered by a bank, which, with depths of less than 3 fathoms (5^m5), extends as much as three-quarters of a mile offshore. The shore at the head of the bay consists of a sandy 15 beach backed by low land; some rocks, with depths of less than 6 feet (1^m8), lie close off the northern part of this beach.

Bajo or Llosa del Rey, a rock with a depth of less than 2 feet (0^m6), lies about half a mile west-north-westward of Punta del Balcarés.

A mole, with depths of 4 or 5 feet (1^m2 or 1^m5) at its head, extends 20 from the shore at Puerto de Pollensa, at the northern end of the above-mentioned beach. Puerto de Pollensa is the port of the town of Pollensa, which lies about 3 miles west-south-westward.

A light is exhibited, at an elevation of 17 feet (5^m2), from a post situated on the head of the mole at Puerto de Pollensa. Five similar 25 lights are exhibited at intervals along the mole.

Anchorage.—Caution.—Bahia de Pollensa is open eastward, and is completely exposed to the frequent gales which originate in the Gulf of Lions. Sudden squalls are also experienced, especially under the high land on the northern side of the bay, and great care is necessary 30 in boats when under sail.

Cala del Pino de la Posada affords excellent shelter from winds between north-west and north-east, in a depth of about 9 fathoms (16^m5); small craft, with local knowledge, can anchor close inshore, in depths of from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms (4^m1 to 5^m9).

35 In fine weather, anchorage can be obtained by large vessels southward or south-eastward of Punta de la Avanzada (*Lat.* $39^\circ 54' N.$, *Long.* $3^\circ 06' E.$), in depths of from 7 to 11 fathoms (12^m8 to 20^m1).

Small vessels can obtain shelter from easterly winds, westward of Punta de la Avanzada, in depths of from one to 3 fathoms (1^m8 to 5^m5), 40 mud; but caution should be exercised for, though the area is not expressly so reserved, it is at times used as an anchorage for seaplanes.

Anchorage can also be obtained, in depths of 9 or 10 fathoms (16^m5 or 18^m3), about $3\frac{1}{2}$ cables east-north-eastward and $2\frac{1}{2}$ cables north-north-westward of Punta Manresa.

45 *Chart 1317.*

MINORCA.—General Remarks.—Minorca, called by the Spanish Menorca, is the north-easternmost of Islas Baleares, and is separated from Majorca by Canal (Freu) de Menorca, which is about 20 miles wide between Cabo del Freu, *see* page 183, and Cabo Dartuch, the 50 south-western extremity of Menorca.

The island is rather flat, and is free from off-lying dangers; there are a few islets close to the land, and what dangers there are lie within half a mile of the coast. It attains its highest elevation, of 1,175 feet

Charts 1187, 160, 2158a.

Chart 1317.

(358^m1), at Monte Toro, a conical mountain near the centre of the island.

Canal de Menorca is deep, and the bottom, in which there are patches of coral, is of sand and shells, in its narrowest part. Northerly winds raise a very heavy sea in the channel.

Western side of Minorca.—Lights.—The whole of the western coast of Minorca is low and cliffy; in it are several unimportant coves.

Cabo Dartuch is low, flat, free from dangers, and steep-to; in fine weather, it frequently happens that the wind is blowing from different directions on either side of the cape.

A light is exhibited, at an elevation of 82 feet (25^m0), from a white conical tower surmounting a white dwelling, 49 feet (14^m9) in height, situated on Cabo Dartuch.

Cabo Negro, where the coast rises to elevations of from 50 to 65 feet (15^m2 to 19^m8), lies about 1½ miles northward of Cabo Dartuch.

Puerto de Ciudadela, a steep-sided creek, with three coves on its northern side, is entered about 2½ miles northward of Cabo Negro, and between them are other coves. Puerto de Ciudadela is not more than half a cable wide and the depths in it decrease from 20 feet (6^m1) in the outer part, to 14 feet (4^m3) off the wharves. Vessels up to about 150 tons can use this creek, but caution is necessary. South-westerly gales cause the sea to break right across the entrance, and send a heavy swell up to the wharves at the head of the creek. The town of Ciudadela is situated at the head of the creek, and is visible from seaward; in it there is a prominent, yellowish cathedral. In 1946, the population was about 11,000.

Torre de San Nicolás is 20 feet (6^m1) in height, and stands on the eastern entrance point of Puerto de Ciudadela; its top attains an elevation of 52 feet (15^m8).

A light is exhibited, at an elevation of 62 feet (18^m9), from a white tower and dwelling, 33 feet (10^m1) in height, on Cabo de los Frares, the western entrance point of Puerto de Ciudadela (*Lat.* 40° 00' N., *Long.* 3° 49' E.).

Cabo Binicous lies about 1½ miles west-north-westward of Cabo de Los Frares, and between them are three coves; it is low and cliffy, and close northward of it is Cala Binicous or d'en Marcet (Maret).

Cabo Bajoli de Menorca (Cape Minorca), the western extremity of the island, lies about one mile northward of Cabo Binicous. On a hill, 240 feet (73^m1) high, about half a mile east-south-eastward of the cape, is an old tower, 33 feet (10^m1) in height, with a larger tower, named Torre del Ram, on lower ground at a short distance east-south-eastward of it. There is a red brick signal station, at an elevation of 265 feet (80^m8), close north-westward of the first-mentioned tower, with a mast, 66 feet (20^m1) in height, on its southern side.

Cabo Natí, the north-western extremity of the island, lies about 2½ miles north-eastward of Cabo Bajoli de Menorca, and between them the coast is about 100 feet (30^m5) high.

Escollo de Natí is an islet, 23 feet (7^m0) high, situated close off Cabo Natí, having a rock, with a depth of about one foot (0^m3), about one cable north-eastward of it.

A light is exhibited, at an elevation of 138 feet (42^m1), from a white tower, in the form of a truncated pyramid surmounted by a turret, 43 feet (13^m1) in height, situated on Cabo Natí.

Charts 1187, 160, 2158a.

Chart 1317.

Anchorage.—With offshore winds, anchorage can be obtained, by vessels with local knowledge, off the entrance of Puerto de Ciudadela, in a depth of about 9 fathoms (16^m5), good holding ground.

- 5 In fine weather, open anchorage can be obtained off Cabo Bajoli de Menorca.

Northern side of Minorca.—Dangers.—Light.—The coast on this side of the island is higher and more indented than that on the western and southern sides.

- 10 Punta del Escué, about 2 miles eastward of Cabo Natí, is 164 feet (50^m0) high, and close off it are some sunken rocks.

Cala Morell, at the eastern end of a bay which is entered between Punta del Escué and a point about three-quarters of a mile eastward, has a beach at its head, through which a stream discharges. Bajo

- 15 Morell, with a depth of 3 fathoms (5^m5), rock, lies about 2 cables northward of the eastern entrance point of the cove; there is a depth of 10 fathoms (18^m3) between it and the coast.

Punta Fray Bernardo lies about one mile eastward of the eastern entrance point of Cala Morell, and the coast between them is high and

- 20 cliffy. Seca del Frare, with a depth of 3 feet (0^m9), rock, and another rock between it and the coast, lies about 1½ cables north-north-westward of Punta Fray Bernardo.

Las Fontanellas is a bay which is entered between Punta Fray Bernardo and Punta Rotja, 295 feet (89^m9) high, about one mile

- 25 eastward. A rock, awash, lies close off Punta Rotja. Cabo Gros (Falconera), about three-quarters of a mile north-eastward of Punta Rotja, is 335 feet (102^m1) high, and is faced with cliffs at the foot of which are some rocks.

Peñal del Antecristo is a clifty headland, about one mile eastward of

- 30 Cabo Gros, which rises, a short distance inland, to a prominent hill, 673 feet (205^m1) high and covered with pine trees, named Falconera de Furinet.

Punta Roca de Sal lies about 1½ miles eastward of Peñal del Antecristo, and between them is a bay, in which are several above-water

- 35 rocks, and at the head of which are three coves. The coast between Punta Roca de la Sal and Cabo Alairó, about 1½ miles eastward, is backed by hills rising to an elevation of 459 feet (139^m9).

Islas Bledas are three in number; the largest, 197 feet (60^m0) high, with a 1½-fathom (3^m2) shoal about one cable north-westward of it,

- 40 lies close northward of Cabo Alairó (*Lat. 40° 04' N., Long. 4° 02' E.*), the passage between being available for boats only. Of the other two, one lies close westward of the cape, and the other, the smallest, lies close inshore on the eastern side of the cape.

Between Cabo Alairó and Cabo Caballeria, about 3 miles north-

- 45 eastward, the coast forms a bay, in which there are several coves. Close to the shores of this bay lie numerous islets, rocks and shoals, amongst which is Escollo del Francés. A tower, the top of which attains an elevation of 56 feet (17^m1), surmounts a point about one mile southward of Cabo Caballeria, and close off this point are two

50 rocky islets.

Isla Nitge, rocky, rather flat, and about 25 feet (7^m6) high, lies close north-westward of Cabo Caballeria, and the passage between them is foul.

Cabo Caballeria, the northern extremity of Minorca, is the northern

Charts 1187, 160, 2158a.

Chart 1317.

end of a peninsula which extends about $1\frac{1}{2}$ miles northward from the general line of the coast. It is 262 feet (79^m9) high, and steep-to; from a distance eastward or westward it appears as an island.

A light is exhibited, at an elevation of 308 feet (93^m9), from a 5 white tower and dwelling, 46 feet (14^m0) in height, situated on Cabo Caballeria.

Bahia de Tirant lies between the peninsula of which Cabo Caballeria is the northern extremity and the peninsula forming the western side of Puerto de Fornells, about 2 miles south-eastward. The shores of 10 this bay, in which there are several coves, are backed by hills from 330 to 440 feet (100^m6 to 134^m1) high.

Anchoragees.—Vessels, with local knowledge, can obtain anchorage, during offshore winds, in the bay between Punta Fray Bernardo and 15 Punta Rotja.

Anchorage, sheltered from easterly winds, can be obtained, by vessels with local knowledge, in a depth of about 16 fathoms (29^m3), sand, south-south-eastward of Isla Nitge.

Bahia de Tirant affords good anchorage, with offshore winds, to small vessels with local knowledge, in depths of from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms 20 (5^m0 to 5^m9), close to the land; winds between north and east send a very heavy sea into the bay.

Chart 148, plan of Port Fornells.

Puerto de Fornells.—Punta Mala and Cabo Fornells are the north-western and north-eastern extremities, respectively, of the 25 peninsula on the western side of this harbour, and close northward of Cabo Fornells lies Islote de Tirant.

The harbour is entered between Islote de Tirant and Na Ponsa, a point about $2\frac{1}{2}$ cables north-eastward.

Punta del Murté lies about one-quarter of a mile north-eastward 30 of Na Ponsa. It is the extremity of Atalaya de Fornells, a cliffy promontory which rises to an elevation of 404 feet (123^m1).

The entrance channel, which is about one cable in width, has depths of 8 fathoms (14^m6), and the depths decrease regularly within the harbour; the holding ground is good, the bottom being of mud and 35 weed.

In the inner part of the harbour lie Islas Sargantana, Rabells, and Los Porros, the first-named, largest, and northernmost, being 39 feet (11^m9) high and having on it the ruins of a castle.

The fishing village of Fornells (*Lat.* 40° 03' N., *Long.* 4° 08' E.) is 40 situated on the north-western side of the harbour, close southward of an old fort.

Life-saving.—A lifeboat is stationed and life-saving appliances are maintained at Puerto de Fornells. See page 15.

Anchorage.—Puerto de Fornells affords good shelter. A vessel 45 entering should steer in mid-channel to avoid the shoals close inshore on either side.

Vessels of deep draught usually anchor about midway between Isla Sargantana and the village of Fornells, but caution is necessary for there is not room for a vessel of more than 328 feet (100^m0) in 50 length to swing in depths greater than $4\frac{1}{2}$ fathoms (7^m8).

Vessels of medium draught can anchor farther in, in a depth of about 5 fathoms (9^m1), with the entrance points of the harbour slightly open of one another.

Charts 1187, 160, 2158a.

Chart 148, plan of Port Fornells.

Small craft can anchor about one cable from the village, in a depth of about $2\frac{1}{2}$ fathoms (5^m0).

Chart 1317.

- 5 **North-eastern side of Minorca.—Dangers.—Light.**—This coast, like the northern one, is considerably indented, and in places is high and cliffy.

Punta Pantinat (Fantirat), a flat, somewhat salient point, lies about $1\frac{1}{2}$ miles east-south-eastward of Punta del Murté and between them
10 the coast gradually decreases in elevation.

Punta Codolada lies about 2 miles east-south-eastward of Punta Pantinat, and between them is a bay, in which are a number of coves and beaches, and at the head of which is a low point, named Punta Tarongé. Los Ofegats are four rocks, about 7 feet (2^m1) high, between
15 $1\frac{1}{2}$ cables north-westward and $4\frac{1}{2}$ cables westward of Punta Codolada.

Punta Nou Cous and Punta de la Torre, on the latter of which stands a prominent tower, lie, respectively, about three-quarters of a mile and $1\frac{1}{2}$ miles south-south-eastward of Punta Codolada. Punta de la Torre separates Cala Moli, on its western side, from Cala de Addaya,
20 on its eastern side.

Llosa del Mitx is a detached rock, with a depth of $3\frac{1}{2}$ fathoms (6^m9), over which the sea breaks in bad weather, lying about $2\frac{1}{2}$ cables north-north-eastward of Punta Nou Cous.

Islas Addaya lie close together, a short distance northward of the
25 eastern entrance point of Cala de Addaya; on the eastern side of the southern and larger islet, which is 72 feet (21^m9) high, are some above-water rocks. A reef extends about one cable northward from the northern islet, and about $2\frac{1}{2}$ cables north-westward of it is a $5\frac{1}{2}$ -fathom (10^m1) patch, which is sometimes marked by breakers. About 2 cables
30 westward of the southern islet are three rocks close together, with reefs extending about one cable north-westward and southward from them.

Cala de Addaya is a narrow creek, the entrance to which is protected by the rocks and reefs westward of Islas Addaya.

Cabo Favaritx lies about 3 miles east-south-eastward of the eastern
35 entrance point of Cala de Addaya, and the coast between them is indented and fringed with rocks extending a short distance offshore. The cape is low, and at a distance appears as three islets; from it the coast trends southward and gradually increases in elevation.

A light (*Lat.* $40^{\circ} 00' N.$, *Long.* $4^{\circ} 16' E.$) is exhibited, at an elevation
40 of 151 feet (46^m0), from a circular tower attached to a two-storied dwelling, 89 feet (27^m1) in height, situated on Cabo Favaritx. See view facing page 137.

Cabo Moseña, about one mile southward of Cabo Favaritx, is a salient projection, from which a reef, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over
45 its extremity, extends about $1\frac{1}{2}$ cables north-north-eastward. In the bay, which is entered between the two capes, is Punta de las Picas, a high projection off which lie some rocks.

Torre Rambla, the top of which attains an elevation of 95 feet (29^m0), stands on a point about one mile southward of Cabo Moseña,
50 and close inshore about 4 cables north-westward of it is a rock, awash.

Isla Colom, 144 feet (43^m9) high, lies close to the coast south-eastward of Torre Rambla. A rock, with a depth of $2\frac{1}{2}$ fathoms (4^m6), lies about 2 cables eastward of the northern extremity of the island. The

Charts 1187, 160, 2158a.

Chart 1317.

eastern extremity of the island is foul for a short distance offshore and three rocks lie close off its south-eastern side.

Cala Grao or de la Albufera is entered close south-westward of Isla Colom. An islet is situated close off the southern entrance point of this cove, and some rocky patches lie on either side of the channel leading to the anchorage. 5

Punta La Galera and Punta Sansá lie about three-quarters of a mile and 2 miles, respectively, southward of Isla Colom.

Bombasa is an above-water rock, situated about 2 cables north-eastward of Punta Sansá, and close inshore about 3 cables northward and 2 cables southward of the point, respectively, are three above-water rocks and a rock with a depth of $1\frac{1}{2}$ fathoms (2^m7). 10

Punta El Pá Grós, about half a mile south-south-eastward of Punta Sansá, terminates in a cliff 148 feet (45^m1) high; about 2 cables north-eastward and east-south-eastward of it, respectively, are a rocky shoal, with a depth of 2 fathoms (3^m7), and two rocks, close together, that dry. 15

Torre Mesquida, the top of which attains an elevation of 66 feet (20^m1), stands on a small point close southward of Punta El Pá Grós, 20 and between it and Cala Murta, about three-quarters of a mile southward, the coast is foul.

From the southern entrance point of Cala Murta, the coast, which is dark, high and cliffy, trends about half a mile south-eastward to Cabo Negro, on the northern side of the approach to Puerto de Máhon, 25 see page 193.

Anchorage.—Vessels with local knowledge can obtain anchorage in the southern part of the bay between Punta Pantinat and Punta Codolada; the approach is made between Punta Tarongé and Los Ofegats, and the bottom is of sand. 30

Vessels with local knowledge can obtain anchorage, sheltered from all winds except those from north-westward, on the north-western side of Isla Colom, in depths of $5\frac{1}{2}$ or $6\frac{1}{2}$ fathoms (10^m1 or 11^m9), sand, with the stern secured to the shore; or, on the south-western side of the island, sheltered from all winds except those from east-north-eastward and east-south-eastward, in a depth of $5\frac{1}{2}$ fathoms (10^m1), with the stern similarly secured. 35

Southern side of Minorca.—Dangers.—Light.—The southern coast of Minorca is free from off-lying dangers, and what rocks and shoals there are lie close inshore. 40

Between Cabo Dartuch, see page 187, and Punta de la Guardia, about three-quarters of a mile eastward, is a bay, in the north-eastern corner of which is Cala Bosch; a submarine telegraph cable, see page 19, the route of which is indicated by a pecked line on the chart, is landed in the cove. 45

Laja de Espets, with a depth of less than 6 feet (1^m8), is an isolated rock about $1\frac{1}{2}$ cables east-south-eastward of Punta de la Guardia.

Punta del Governadó (*Lat.* $39^\circ 55' N.$, *Long.* $3^\circ 54' E.$) lies about $2\frac{1}{2}$ miles eastward of Punta de la Guardia, and in the low coast between there are numerous coves. Torre Artuiz, 23 feet (7^m0) in height, 50 stands at an elevation of 203 feet (61^m9), about three-quarters of a mile north-eastward of Punta de Governadó.

Cala Santa Galdana, with a beach at its head, lies about $2\frac{3}{4}$ miles east-north-eastward of Punta del Governadó.

Charts 1187, 160, 2158a.

Chart 1317.

Punta Rabiosa, a low point, and Cabo de las Peñas, the western entrance point of Caleta Llucalari, are, respectively, about $2\frac{3}{4}$ and $6\frac{1}{4}$ miles south-eastward of Cala Santa Galdana, and between them are
5 Playa de Santo Tomás, Playa de Talis and Playa de Son Bou.

Escollo de Codrell is a rock situated at the junction of Playa de Santo Tomás and Playa de Talis.

Escull de Talis, with a depth of $1\frac{1}{2}$ fathoms (2^m7), lies about one cable off the eastern part of Playa de Talis.

- 10 Escull de La Galera is an above-water rock lying about 2 cables off the middle of Playa de Son Bou.

Caleta San Llorens is entered about three-quarters of a mile south-eastward of Caleta de Llucalari, and between them the cliffs attain an elevation of 262 feet (79^m9).

- 15 Cabo Fonts is faced with cliffs 43 feet (13^m1) high, and lies about $6\frac{1}{4}$ miles south-eastward of Caleta de Llucalari; between them the cliffs attain an elevation of about 230 feet (70^m1). Torre Nueva, the top of which attains an elevation of 233 feet (71^m0), is a prominent object, and stands near the edge of the cliffs about one mile south-
20 eastward of Caleta de Llorens.

Cala Binisafulla is entered about 4 cables eastward of Cabo Fonts; it is foul and in its eastern part is Islote Escull Marsal; there are three islets, almost joined together, in its western part.

- 25 Atalaya de Torret rises to an elevation of 240 feet (73^m1), about $1\frac{1}{4}$ miles eastward of Islote Escull Marsal.

Bajo Es Caragol is awash and lies 2 cables offshore about one mile southward of Atalaya de Torret.

- Isla del Aire, about $2\frac{1}{4}$ miles south-eastward of Atalaya de Torret, lies situated south-eastward of Punta Mabres, from which it is separated
30 by a channel, about half a mile wide, that is available to vessels, with local knowledge, drawing up to 26 feet (7^m9). The north-western side of the island is flat, but its south-eastern side is high, cliffy, and steep-to. Off the north-eastern side of the island, and about one cable from it, is a rocky islet.

- 35 A light is exhibited, at an elevation of 171 feet (52^m1), from a white concrete tower and dwelling, 118 feet (36^m0) in height, situated on the summit of Isla del Aire (*Lat. $39^{\circ} 48' N.$, Long. $4^{\circ} 17' E.$*).

- Anchorage.**—Anchorage with offshore winds can be obtained off the beaches between Punta Rabiosa and Cabo de las Peñas, where
40 there are depths of from 11 to 16 fathoms (20^m1 to 29^m3) about 4 cables offshore.

- Fondeadero de los Esquexos is the open roadstead on the north-western side of Isla del Aire. Care must be taken to avoid Bajo del Caragol, and a vessel should anchor in the eastern part of the roadstead,
45 where there is a depth of 11 fathoms (20^m1) about 3 cables offshore. The best berth is, in depths of from 14 to 22 fathoms (25^m6 to 40^m2), with Torre Nueva seen over Cabo Fonts, bearing about 303° .

- South-eastern side of Minorca. — Dangers. — Light. — Buoyage.**—From Punta Mabres the coast trends about $3\frac{1}{2}$ miles
50 north-north-eastward to Punta de San Carlos; it is low and free from off-lying dangers.

Punta Rafalet and Punta Girada lie about $1\frac{1}{4}$ and $2\frac{3}{4}$ miles, respectively, north-north-eastward of Punta Mabres.

Torre del Penjat, 26 feet (7^m9) in height, stands near the coast,

Charts 1187, 160, 2158a.

Chart 1317.

about half a mile northward of Punta Girada; its top attains an elevation of 167 feet (50^m9).

Chart 148, plan of Port Mahon.

Punta de San Carlos is the southern entrance point of Puerto de Mahón, *see* below, and from it a rocky bank, with depths of less than 5 fathoms (9^m1), extends about three-quarters of a cable offshore; Cala de San Estéban, entered close southward of the point, is a narrow creek on the northern side of the entrance of which are the dark-coloured walls of the ruins of Castillo de San Felipe. 5 10

A light is exhibited, at an elevation of 72 feet (21^m9), from a white iron column, 20 feet (6^m1) in height, situated near a white conical tower, on Punta de San Carlos.

A light-buoy, painted red and exhibiting a *red flashing* light, *every three seconds*, marks the edge of the bank eastward of Punta de San Carlos. 15

La Mola, or the northern side of the entrance to Puerto de Mahón, is a peninsula, on which stand some prominent barracks and a tall radio mast. La Mola attains an elevation of 266 feet (81^m1), and its northern and southern sides are faced with cliffs; those on the southern side and near its eastern end are reddish. *See* view on chart 148. 20

Punta de Fuera, or de la Mola, the southern extremity of the peninsula, lies about 3 cables north-north-eastward of Punta de San Carlos, and on its eastern side is Ensenada Clot de la Mola. A rocky bank, with depths of less than 5 fathoms (9^m1), extends about three-quarters of a cable southward of Punta de Fuera. 25

A light-buoy, painted black and exhibiting a *green flashing* light, *every three seconds*, marks the edge of the bank southward of Punta de Fuera (*Lat.* 39° 52' N., *Long.* 4° 19' E.).

Punta del Esperó, the eastern extremity of La Mola, lies about one mile east-north-eastward of Punta de Fuera. It attains elevations of from 200 to 260 feet (61^m0 to 79^m2) and about 2 cables westward of it is a signal station, with which vessels can communicate by means of the International Code of Signals. 30

Los Freus are two breaks in the narrow isthmus of La Mola, which are at times inundated, and through which may be seen the suburb of Villacarlos and the town of Mahón. An above-water rock lies on a small shoal, 2 cables offshore, north-eastward of Los Freus. 35

From Los Freus, the coast trends about one mile northward to Cabo Negro, *see* page 191, and is mostly cliffy, with numerous rocks and shoals close off it. The cape is the extremity of a narrow projection, extending about 1½ cables north-eastward from the coast; close inshore, about 6 cables southward of it, lie Las Aguilas, two rocky islets, 124 feet (37^m8), high. 40

Measured distance.—A measured distance of 6,076 feet (1,852^m0) exists off the south-eastern coast of Minorca. A pair of beacons stands on Punta Rafalet and another pair on Punta Girada, marking the limits of this distance. The running course is 019° or 199°.

Puerto de Mahón. — Dangers. — Lights. — Buoyage. — This harbour is entered between Punta de San Carlos and Punta de Fuera. 50

Punta de San Felipet, about 1½ cables north-westward of Punta de Fuera, is the southern extremity of Isla Lazareto on the north-eastern side of the harbour, on which stand the prominent buildings of the

Chart 148, plan of Port Mahon.

lazaretto. A spit, with a depth of $3\frac{1}{2}$ fathoms (6^m4) over its extremity, extends about one cable south-eastward from Punta de San Felipet.

- 5 A conical light-buoy, painted black and exhibiting a *green flashing* light, *every three seconds*, marks the north-eastern side of the entrance channel close westward of Punta de San Felipet.

Caía de la Taulera, on the eastern side of the above-mentioned peninsula, is a narrow inlet reserved for the exclusive use of the military authorities; entry is prohibited, except in cases of absolute necessity.

- 10 Laja del Moro, with depths of less than 5 fathoms (9^m1), extends about half a cable from the shore on the south-western side of the harbour westward of Punta de San Felipet.

A conical light-buoy, painted red and exhibiting a *red flashing* light, *every three seconds*, marks the edge of Laja del Moro.

- 15 A light is exhibited, at an elevation of 40 feet (12^m2), from a green column, with a spiral stairway, on a circular masonry base, situated on Punta del Lazareto (Ravells), the western extremity of Isla Lazareto.

A light is exhibited, at an elevation of 28 feet (8^m5), on Punta de Ne Cafayes, about $4\frac{1}{2}$ cables north-westward of Punta del Lazareto.

- 20 Isla Plana lies about 2 cables north-eastward of Punta de Cala Fonts, and is fringed by a shoal bank extending about one-quarter of a cable offshore. Eastward of Isla Plana is Cala de San Jorge, which is connected with Cala de la Taulera by a canal.

- 25 The suburb of Villacarlos is situated on the south-western side of the harbour, westward of Punta de Cala Fonts.

Isla del Rey, on which is a military hospital and north-eastward of which is Cala Llonga, lies about half a mile north-westward of Isla Plana; a shoal bank extends about half a cable south-eastward from it.

- 30 A light-buoy, painted black and exhibiting a *green flashing* light, *every three seconds*, marks the edge of the bank bordering the southern side of Isla del Rey.

Punta de Cala Figuera, the north-western entrance point of Cala Figuera, is situated on the south-western side of the harbour about $4\frac{1}{2}$ cables westward of Isla del Rey.

- 35 A light is exhibited, at an elevation of 20 feet (6^m1), from the front of a house situated on Punta de Cala Figuera (*Lat. $39^\circ 53' N.$, Long. $4^\circ 16' E.$*).

- Isla Pinta is connected with the northern shore of the harbour by a wooden bridge, and lies about one-quarter of a mile west-north-
40 westward of Punta de Cala Figuera. A depth of $5\frac{1}{2}$ fathoms (10^m5) can be carried through the main channel almost as far as this islet.

A light is exhibited on the southern extremity of Isla Pinta.

- A light is exhibited on the head of each of the three jetties at the naval establishment on the northern shore of the harbour close north-
45 westward of Isla Pinta.

The town of Mahón is situated on the southern side of the harbour above Isla Pinta.

- Escuy de los Frares lie on a spit which extends about three-quarters of a cable southward from the north-eastern shore of the harbour,
50 about 3 cables westward of Isla Pinta, and are marked by a beacon painted red and black in horizontal bands.

Anchorage.—Directions.—Pilotage, *see* page 20, is compulsory.

Monte Toro, *see* page 187, bearing 309° , leads to the entrance of the harbour.

Charts 1317, 1187, 160, 2158a.

Chart 148, plan of Port Mahon.

Punta del Lazareto, in line with a turret on a house at San Antonio farm, about half a mile north-north-westward of Isla del Rey, bearing about 326°, or a reddish-yellow house near Punta de Cala Fonts bearing 319°, and just open north-eastward of Punta d'en Redó, 5 about 6 cables north-westward of Punta de San Carlos, leads into the entrance of the harbour clear of all dangers.

The deepest channel passes south-westward of all the islets in the harbour.

The anchorage giving the greatest swinging room is named La 10 Plana, and is between Isla del Rey and Punta de Cala Figuera.

A vessel should avoid anchoring on the slope of the north-eastern shore of the harbour, for strong northerly winds might cause a vessel to drag.

In fine settled weather, anchorage can be obtained off the entrance 15 of the harbour, in depths of from 13 to 20 fathoms (23^m8 to 36^m6), sand and good holding ground; but only in a case of urgent necessity should a vessel anchor in the entrance of Ensenada Clot de la Mola.

The level of the water in the harbour is affected by the prevailing winds; the lowering of the level is a sign of approaching bad weather. 20

Northerly and north-easterly winds give rise to a strong south-west-going current off the entrance of the harbour; this current is almost constant, and only with strong south-westerly winds does it set on the opposite direction.

Port facilities.—Communications.—The town of Mahón, with 25 its suburb of Villacarlos, had, in 1946, a population of about 17,500. The principal exports are cheese, cattle and footwear. A British Consular officer resides in the town (*Lat.* 39° 53' N., *Long.* 4° 16' E.). Supplies can be procured. Water is supplied in a tank-vessel. Moderate stocks of coal and fuel oil are maintained. Minor repairs can be 30 executed. For deratisation, *see* page 23.

There is regular steamer communication with Barcelona and Majorca.

Climatic table.—*See* page 52.

Charts 1317, 1187, 160, 2158a.

CHAPTER V

SARDINIA—WESTERN AND SOUTHERN SIDES

Charts 161a and b.

WESTERN SIDE OF SARDINIA.—General remarks.—The western coast of Sardinia, called by the Italians Sardegna, trends about 130 miles southward from Capo Falcone, the north-western extremity of the mainland, and is somewhat more indented than the eastern coast. There are several dangers within 6 miles of the middle of this side of Sardinia, and off its southern end are two islands, and several islets or rocks; elsewhere it is free from off-lying dangers.

Chart 161a.

- 10 **Caution.**—Longitudes accepted from chart 161a require adjustment to agree with those on chart 161b and larger scale charts (*see* caution under title of chart).

Chart 3916.

- Coast.—Dangers.**—Capo Falcone is the northern extremity of a small peninsula, the summit of which attains an elevation of 633 feet (192^m9) about one mile southward of the cape and is surmounted by a prominent tower (*Lat.* 40° 57' N., *Long.* 8° 12' E.). Close northward of the cape are some islands, *see* page 221.

- 15 Punta Scoglietti (Coscia di Donna), about 2½ miles south-south-westward of Capo Falcone, is low, rocky, and when seen from southward is of a whitish colour; it should not be approached within half a mile, for it is fringed with rocks and shoals.

- Isolotto Porri, 187 feet (57^m0) high, lies close to the coast about 3½ miles south-south-eastward of Punta Scoglietti; it shows up from southward and appears conical in shape, but from northward it is not easy to identify. From abreast the islet, the coast trends about 6 miles south-south-westward to Capo Mannu, and is high, rocky, and inaccessible; near the middle of it is Punta Lizo.

Chart 161b.

- 30 Capo dell'Argentiera, about 4 miles south-south-westward of Capo Mannu, is easily identified.

- San Nicolò dell'Argentiera is an easily identified mining village, and in it are a small church and a chimney. It is situated on the shore of a creek on the northern side of Capo dell'Argentiera. The creek is only available to small vessels with local knowledge, and is dangerous during onshore winds.

Porto Ferru, about 4 miles south-eastward of Capo dell'Argentiera,

Charts 160, 2158a.



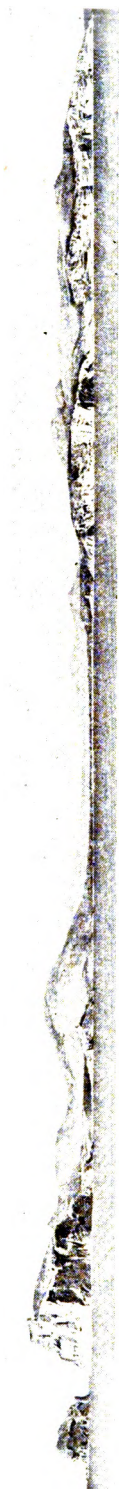
*Torre del
Porticciuolo,
Monte Doglia.*

Punta delle Gessiere.

*Punta delle Gessiere from north-westward.
(Original dated 1883.)*

*Torre Pigna,
bearing 144°,
5 miles.†*

*Isolotto
Foradada.*



*Capo Caccia lighthouse,
bearing 341°, 2 miles.*

*Monte
Timidone.*

*Approach to Porto Conte from southward.
(Original dated 1880.)*

*Torre
Nuova.*

*Punta del
Giglio.*

Monte Mannu.



*Isolotto
Pagliosa.*

*Capo Marargiu,
bearing 066°, 5½ miles.
Capo Marargiu from west-south-westward.
(Original dated 1883.)*

*Torre
Argemina.*



Monte Forte, Torre Negra, Torre Rossa.
bearing 068°, 8¼ miles.

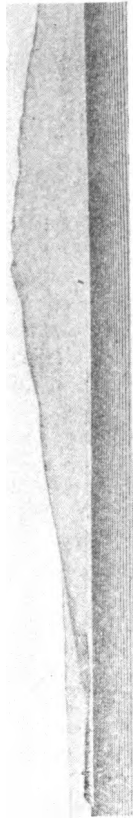
Monte Forte from west-south-westward.



*Torre
Foghe.*

*Torre
Columbargia.*
Monte Urtigu,
bearing 123°, 18 miles.

Monte Urtigu from north-westward.



*Summit, bearing
048°, 26¼ miles.*

*Capo
Mannu.*

Monte Urtigu from south-westward.

(Originals dated 1883.)

Chart 161b.

is a cove with a sandy beach at its head. On the northern entrance point, Torre Negra or Ferru stands on a small conical promontory covered with bushes and its top is elevated 210 feet (64^m0). On the southern entrance point stands Torre Bantine Sale or Rossa, dark red, 65 feet (19^m8) high and partly demolished. About one mile inland from the cove is Lago Barazza, a saltwater lagoon at the foot of Monte Forte, which rises to an elevation of 1,526 feet (465^m0), *see* view facing this page. 5

Torre Porticciuolo, the top of which is elevated 131 feet (39^m9), 10 stands about 2 miles southward of Torre Rossa, and the coast between them is low, undulating, indented, and fringed with rocks.

Punta delle Gessiere, *see* view facing page 196, lies about 2½ miles west-south-westward of Torre del Porticciuolo, and the coast between them is high. 15

Chart 1123, plan of Porto Conte and Alghero.

From Punta delle Gessiere, the coast trends about 4 miles southward to Capo Caccia, and is high and inaccessible.

Isolotto Piana, 351 feet (107^m0) high, and Isolotto Foradada, about 600 feet (182^m9) high, lie close to the coast, about 1½ and 3½ miles southward, respectively, of Punta delle Gessiere. Isolotto Foradada is pierced by a hole and lies in the approach to Cala d'Inferno, the shores of which are rocky. Torre Pegna, the top of which is elevated 889 feet (271^m0), stands on the top of the cliffs about one mile northward of the western entrance point of Cala d'Inferno. 25

Porto Conte.—Lights.—Storm signals.—This inlet affords sheltered anchorage, and is entered between Capo Caccia and Punta del Giglio (*Lat.* 40° 34' N., *Long.* 8° 12' E.), about 2 miles east-north-eastward.

Capo Caccia, *see* view facing page 196, is the southern extremity of 30 a narrow, cliffy peninsula, 728 feet (221^m9) high, on the western side of which is the entrance of Grotta di Nettuno. On the summit of the cape is a signal station, which is open for public correspondence and from which storm signals, *see* page 12, are displayed.

A light is exhibited, at an elevation of 610 feet (185^m9), from a 35 circular tower on a white three-storied building, 79 feet (24^m1) in height, situated on Capo Caccia. *See* view facing page 200.

Monte Timidone, 1,188 feet (362^m1), and Monte Doglia, 1,430 feet (435^m9) high, are situated, respectively, westward and eastward of the head of the inlet. 40

Punta del Giglio rises to an elevation of 354 feet (107^m9), and on it stands Torre del Giglio.

Cala del Bollo, on the western side of Porto Conte, is entered between Punta del Bollo and Punta del Quadro about half a mile north-north-eastward. A tower, the top of which is elevated 111 feet (33^m8), stands 45 on Punta del Bollo. This cove is exposed south-eastward, and in its southern part is a landing place in front of two buildings.

Cala Tramariglio is entered between Punta Tramariglio, about half a mile northward of Punta de Quadro, and Punta de Frara, 3 cables north-north-eastward. This cove is open south-eastward, and the 50 depths in it are shoal. On Punta Tramariglio, surmounting a small rocky conical hill, is a tower, the top of which is elevated 213 feet (64^m9).

Cala Torre del Conte, on the eastern side of the head of the inlet, is sheltered from all winds, and on its south-eastern entrance point are

Chart 1128, plan of Porto Conte and Alghero.

some buildings and Torre Nuova ; near these buildings is a masonry landing place. A pier projects from the south-eastern side of Cala Torre del Conte about half a mile eastward of the south-eastern entrance point.

A light is exhibited, at an elevation of 57 feet (17^m4), from a white iron column on a white iron hut, 26 feet (7^m9) in height, situated close westward of Torre Nuova.

Anchorage.—Anchorage can be obtained, in the middle of Porto Conte, about one mile south-westward of Torre Nuova, in a depth of 11 fathoms (20^m1), about half a mile westward of Torre Nuova, in a depth of 5½ fathoms (10^m1), or 3 cables north-north-eastward of the tower, in a depth of 3½ fathoms (5^m9).

Rada di Alghero.—**Dangers.**—**Lights.**—This roadstead is entered between Capo Galera, about 2 miles eastward of Punta del Giglio, and the town of Alghero, about 3 miles eastward ; at its head is an extensive, undulating plain that is partly cultivated. The western shore is rocky, and the eastern shore low and sandy.

Capo Galera is the south-eastern extremity of a hilly promontory, the southern side of which is steep-to, separating Porto Conte from Rada di Alghero, and connected with the mainland by a low plain ; nearly midway between Punta del Giglio and Capo Galera, Monte Ramazino rises to an elevation of 554 feet (168^m9).

Torre Galera (*Lat.* 40° 35' N., *Long.* 3° 15' E.), a large, round, yellowish-red tower, 13 feet (4^m0) high, stands on a low point about half a mile northward of Capo Galera, and about one-quarter of a mile northward of it are some abandoned buildings. A reef, with a large above-water rock near its extremity, extends about 1½ cables southward from a point close eastward of these buildings.

Punta Nera rises to an elevation of 115 feet (35^m0) about one mile east-north-eastward of Torre Galera, and from it a bank, with depths of less than 3 fathoms (5^m5), extends about 2 cables southward.

The shore between Punta Nera and the town is fronted by a shoal bank extending three-quarters of a mile offshore in places ; and about 1½ miles north-eastward of the point is the shallow entrance of Stagno di Calich, spanned by a masonry bridge with three arches.

A prominent belfry on a building stands near the coast about 1¼ miles northward of the town.

Isolotto Maddalenetta, about 9 cables north-westward of the town, is rocky, about 13 feet (4^m0) high, and on it are the ruins of a chapel. It is easily identified for, being of a reddish colour, it shows up against the light sandy background. It lies on the coastal bank, which with depths of less than 3 fathoms (5^m5) extends 1½ cables south-westward of it.

Chart 1128, plan of Alghero.

Alghero stands on a rocky promontory, and is surrounded by medieval ramparts. The landing place, with depths alongside of from 10 to 13 feet (3^m0 to 4^m0), is near a port in the northern wall. Wine, oil, cattle, and fish are exported. Lighters are available. In 1951, the population was about 19,600.

Fresh provisions can be procured. Water is laid on to the quay.

A mole extends about one cable west-north-westward from the north-western end of the town. A bank, with depths of less than 3 fathoms (5^m5), extends about two cables west-south-westward ; and

Charts 161b, 160, 2158a.

Chart 1128, plan of Alghero.

a similar bank extends about $2\frac{1}{2}$ cables north-westward of the head of the mole. Secca del Traditore, with a depth of less than 6 feet (1^m8), lies about a quarter of a cable south-westward; and Secca delle Murge, with a depth of less than 6 feet (1^m8), lies about three-quarters of a cable northward of the head of the mole. 5

A light is exhibited, at an elevation of 39 feet (11^m9), from an iron column on a circular concrete base, 31 feet (9^m4) in height, situated at the head of the mole.

A light is exhibited, at an elevation of 18 feet (5^m5), from a red iron column, situated on the head of a short spur close north-westward of the health office. 10

A mole extends about one cable westward and thence about three-quarters of a cable west-south-westward from a position about 2 cables north-eastward of the health office. In 1951, work was in progress extending to this mole west-south-westward. 15

Pilotage.—Pilotage is compulsory and is carried out by local pilots. See page 20.

Chart 1128, plan of Porto Conte and Alghero.

Anchorage.—Rada di Alghero affords anchorage, with good holding ground, about three-quarters of a mile westward of Isolotto Maddalenetta, in depths of from 10 to 12 fathoms (18^m3 to 21^m9), sand and weed. 20

Small vessels, with local knowledge, can anchor, in a depth of $4\frac{1}{2}$ fathoms (8^m7), weed, about midway between Isolotto Maddalenetta and the mole at Alghero; or in 7 or 8 fathoms (12^m8 or 14^m6), sand and weed, about 2 cables eastward of Torre Galera. 25

Coast.—Dangers.—From Alghero, the coast trends about $3\frac{1}{2}$ miles south-south-eastward to Punta Poglina, and is fringed with rocks and shoals extending a short distance offshore.

Cala Lavatoio, Cala Buona, and Cala Il Cantaro lie within one mile southward of the town. 30

Punta Poglina is low and on it stands Torre Poglina, the top of which is elevated 213 feet (64^m9); close off the point is a low above-water rock.

Chart 161b.

From Punta Poglina, the coast trends about 10 miles southward to Capo Marargiu, and is rocky and in most places unapproachable; in it are several coves with short beaches at their heads. 35

Porto Poglina, about $1\frac{1}{2}$ miles east-south-eastward of Punta Poglina, is a rocky cove frequented only by coral fishers. 40

Monte Pedra Ettori (Petratori) rises gently to an elevation of 2,356 feet (718^m1) about $3\frac{1}{2}$ miles south-eastward of Porto Poglina.

Torre Badda Iana (Baddaiana) stands near the coast about 3 miles southward of Porto Poglina (*Lat.* $40^\circ 27' N.$, *Long.* $8^\circ 24' E.$); its top is elevated 1,152 feet (351^m1). 45

Isolotto Pagliosa lies close inshore about 5 miles southward of Torre Badda Iana, and at a short distance eastward of it is Cala Tonara. Porto Tangone lies about midway between Torre Badda Iana and Cala Tonara.

Monte Mannu rises to an elevation of 2,631 feet (801^m9) about 2 miles east-north-eastward of Isolotto Pagliosa. 50

Capo Marargiu, see view facing page 196, is fronted by rocks and shoals extending about half a mile south-westward of it.

Torre Argentina stands about $2\frac{1}{2}$ miles south-eastward of Capo

Chart 161b.

Marargiu, and about midway between them is Cala Fenocchio. The tower is fairly prominent, but close eastward of it is a better landmark, consisting of a steep-sided hill scored with vertical furrows. Close eastward of the tower is a sheltered cove available to small craft with local knowledge, except during south-westerly winds.

Fiume Temo flows into the sea about $2\frac{1}{2}$ miles south-south-eastward of Torre Argentina. In 1946, it could be entered by small vessels, with local knowledge, drawing $6\frac{1}{2}$ feet (2^m0), and can be ascended by small craft for some distance, but the depths are liable to considerable alteration. Notice of arrival must be given in case a pilot is required.

Bosa Marina stands on the southern bank and near the mouth of Fiume Temo; in it is a church and at it is a wharf.

Bosa is situated about $1\frac{1}{2}$ miles inland and is surrounded by hills; in it stands the ancient Castello Malaspina.

Isola Rossa.—**Light.**—Isola Rossa, 52 feet (15^m8) high, lies close off the southern entrance point of Fiume Temo, with which it is connected by a dyke. On the islet is a large round tower.

A light is exhibited, at an elevation of 84 feet (25^m6), from an iron structure, 53 feet (16^m2) in height, in front of a yellow building situated on the south-eastern extremity of Isola Rossa.

Anchorage.—Open anchorage can be obtained, off the mouth of Fiume Temo, about $2\frac{1}{2}$ cables north-westward of the tower on Isola Rossa, in depths of about 9 fathoms (9^m6 to 16^m5).

There is anchorage in the small cove eastward of Isola Rossa.

Coast.—**Dangers.**—From the mouth of Fiume Temo, the coast, backed by cultivated land, trends about 7 miles southward to that of Fiume Mannu, and is high and rocky, with numerous above-water rocks close off it.

Tresnuraghes (*Lat.* 40° 15' N., *Long.* 8° 31' E.) lies 2 miles inland, about 3 miles southward of Bosa, and is visible from seaward; its cathedral with a dome and two spires is prominent.

Torre Columbargia, Torre d'Ischia Ruja, and Torre Foghe, the tops of which are at elevations, respectively, of 108, 170, and 233 feet (32^m9, 51^m8, and 71^m0), are situated on the coast about $3\frac{1}{2}$, $5\frac{1}{2}$, and $6\frac{1}{2}$ miles southward of the light-structure on Isola Rossa. Close off Torre Columbargia is an islet. About midway between Torre Columbargia and Torre d'Ischia Ruja above-water rocks extend about half a mile offshore. Torre Foghe stands on the northern entrance point of Fiume Mannu.

The town and cathedral of Cùglieri stand at an elevation of 1,572 feet (479^m1), on the northern slope of Monte Urtigu, about $4\frac{1}{2}$ miles eastward of Torre d'Ischia Ruja; both show up well from seaward.

Monte Urtigu rises to an elevation of 3,446 feet (1,050^m0) about 7 miles east-south-eastward of Torre Foghe, *see* views facing page 197.

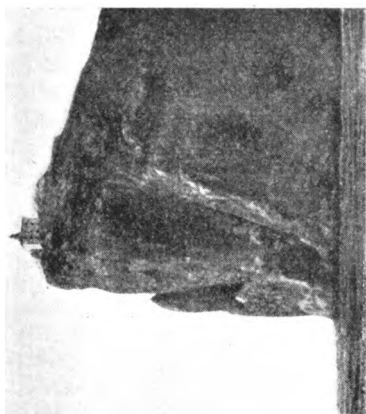
A ruined tower stands at an elevation of 216 feet (65^m8), on Capo Nieddu about $1\frac{1}{2}$ miles southward of Torre Foghe.

Chart 3917.

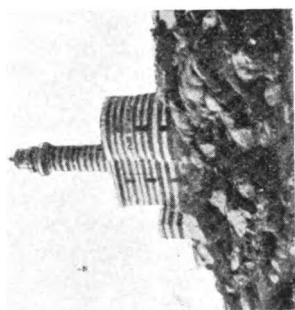
Torre Pittinuri, 95 feet (29^m0) high, is situated about 3 miles south-south-eastward of Capo Nieddu, and stands on the northern entrance point of the small Baia di Santa Caterina.

Torre di Su Puttu, 52 feet (15^m8) high, stands about one mile southward of Torri Pittinuri, and from it the low, marshy coast trends

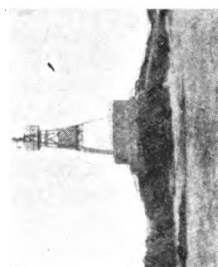
Charts 160, 2158a.



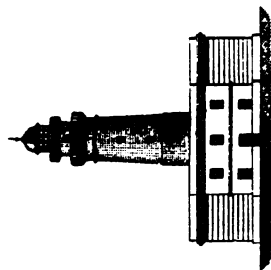
Capo Caccia lighthouse.



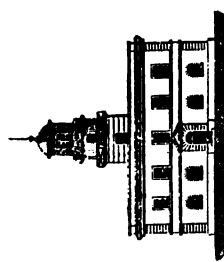
Cavoli lighthouse.



Isolotto Ghinghetta
lighthouse.



Capo Sandalo
lighthouse.
(Originals dated 1941.)



Capo Spartivento
lighthouse.



Il Catalano,
bearing 000°, 2 miles.
Isolato Mal di Ventre.
Islets north-westward of Golfo di Oristano from southward.



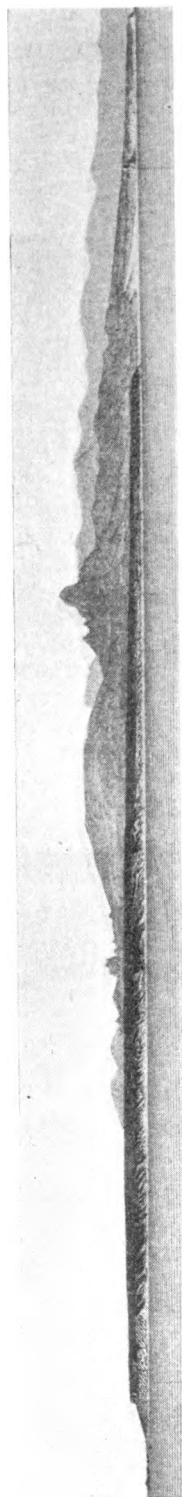
*Torre Monte
de Arcuentu
Flumendorgiu.*

Capo Frasca.

*Monte Sa
Irbina.*

*Torre di
San Giovanni
di Sinis,*
bearing 083°, 11½ miles.

Approach to Golfo di Oristano from westward.



*Torre di
Flumendorgiu.*

Mont Arcuentu.

The plateau of Santadi from north-westward.
(Originals dated 1883.)

Capo Frasca,
bearing 130°,
3½ miles.

Chart 3917.

about $3\frac{1}{4}$ miles south-westward to Torre Scala de Sali, which stands on a rocky outcrop, 72 feet (21^m9) high.

Capo Mannu is the extremity of a rocky peninsula, 157 feet (47^m8) high and sloping eastward, and is situated about 3 miles westward of Torre Scala de Sali; the peninsula is joined to the mainland by a low isthmus on which is a tower situated about $1\frac{1}{2}$ miles south-westward of Torre Scala de Sali, and on its western side are two more towers. On the northern side of the isthmus is Cala Il Peloso; and on the southern side is Cala Saline. 10

A detached, 16-foot (4^m9) patch lies in the approach to Cala Il Peloso, about one mile west-north-westward of Torre Scala de Sali.

Isolotto Peloso, 39 feet (11^m9) high, with the ruins of a beacon on it, lies close off the northern extremity of the peninsula, and from it a shoal spit extends about half a mile north-north-eastward. Tunny 15 nets, *see* page 27, are laid out annually in the vicinity of Isolotto Peloso.

Anchorage.—Cala Saline affords anchorage, sheltered from north-easterly and south-easterly winds, to vessels with local knowledge.

Coast.—From Capo Mannu, the coast trends about 11 miles south- 20 ward to Capo San Marco; its northern part is low and marshy, but its southern half is backed by a range of low hills covered with scrub.

Punta Catalanetto, about $3\frac{1}{2}$ miles southward of Capo Mannu, is fringed with above-water rocks, and about 4 miles southward of it lies Punta del Sevo (*Lat.* 39° 54' N., *Long.* 8° 25' E.). 25

Torre Sevo, 39 feet (11^m9) high, stands on a point about three-quarters of a mile south-south-eastward of Punta Sevo.

Off-lying islet.—**Dangers.**—**Light.**—Isolotto Mal di Ventre, about 4 miles westward of Punta Catalanetto, is 59 feet (18^m0) high and covered with scrub, *see* view facing this page. Its western extremity is steep and rocky, and at either end and near its centre it rises slightly in elevation. It is surrounded by a shoal bank which extends about one mile north-eastward and three-quarters of a mile south-westward of it. On this bank lie many rocks, both sunken and awash, and close off the extremity of the north-eastern extremity of the bank is a detached 29-foot (8^m8) patch. On the south-eastern side of this islet is a cove available to small craft with local knowledge. The islet is frequented by fishermen from March to October, annually. 35

A detached shoal, awash, lies about one mile south-westward of the south-western extremity of Isolotto Mal di Ventre. 40

A detached, 26-foot (7^m9) rocky patch lies about $3\frac{1}{2}$ miles southward of the south-western extremity of Isolotto Mal di Ventre.

All the foregoing dangers are covered by the *red* sector of Il Catalano light, between the bearings 180° and 200°. In 1945 this light was damaged and out of action. 45

Il Catalano, a dark-coloured rock 36 feet (11^m0) high, lies on a shoal about 6 miles southward of Isolotto Mal di Ventre. There is a detached rock, with a depth of less than 6 feet (1^m8), about 6 cables north-north-eastward of it, and a detached, 39-foot (11^m9) rock lies about one mile south-south-westward of it. 50

Anchorage.—Anchorage can be obtained, in depths of 9 fathoms (16^m5), about half a mile south-eastward of Isolotto Mal di Ventre, sheltered from north-westerly winds.

Golfo di Oristano.—**Dangers.**—**Lights.**—This bay, *see* view

Chart 3917.

facing page 201, is entered between Capo San Marco and Capo Frasca about $5\frac{1}{2}$ miles south-south-eastward, and about 14 miles eastward of the latter Monte Sa Trebina rises to an elevation of 2,608 feet (794^m9),
 5 see chart 161a.

Capo San Marco, see view facing page 201, is the extremity of a small rocky promontory, and is joined to the mainland northward of it by a low, narrow, sandy spit, on which are Torre Vecchia, which is small, cylindrical and inconspicuous, Torre San Giovanni di Sinis, and the
 10 village of San Giovanni di Sinis. Torre San Giovanni di Sinis is white, circular, and conspicuous; it is surmounted by two small turrets, the tops of which are at an elevation of 167 feet (50^m9). The village of San Giovanni di Sinis stands amidst the ruins of an ancient city, but does not show up well from seaward.

15 A light is exhibited, at an elevation of 189 feet (57^m6), from a yellow circular tower with two balconies surmounting a yellow two-storied building, 51 feet (15^m5) in height, situated on Capo di San Marco.

Capo Frasca is the steep termination of the plateau of Santadi, see page 203, and on its eastern side, about $1\frac{1}{2}$ miles from its extremity,
 20 is Torre Frasca, which is not visible from seaward. About 2 miles south-south-eastward of Torre Frasca is Torre Marceddi.

A light is exhibited, at an elevation of 236 feet (71^m9), from a grey square stone tower, 16 feet (4^m9) in height, on Capo Frasca. In 1945 this light was damaged and out of action.

25 The shores of Golfo di Oristano are mostly low and sandy, and behind them are extensive lagoons and marshes, rendering the neighbourhood unhealthy. Most of the lagoons abound in fish, and the country inland of them is fertile and cultivated.

Fiume Tirso, the largest river in Sardinia, flows into the bay about
 30 5 miles east-north-eastward of Capo San Marco.

The head of the bay is fringed by a bank, which, with depths of less than 18 feet (5^m5), extends as much as 2 miles offshore in places.

Torre Grande, a large, grey, circular tower, 48 feet (14^m6) in height, stands on the shore about $1\frac{1}{2}$ miles north-westward of the mouth of
 35 Fiume Tirso, and is prominent. Near it are some buildings, amongst which is the custom house, and a landing pier. Another pier lies about one mile south-eastward of the tower.

A light is exhibited, at an elevation of 61 feet (18^m6), from a structure on Torre Grande (*Lat.* 39° 54' N., *Long.* 8° 31' E.), the whole of which is
 40 54 feet (16^m5) in height.

Oristano lies about $2\frac{1}{2}$ miles north-eastward of the mouth of Fiume Tirso. There is a prominent, tall, octagonal belfry in the town.

Cabras is a town, about $1\frac{1}{2}$ miles north-north-eastward of Torre Grande.

45 **Anchorage.**—Torre Vecchia anchorage is $4\frac{1}{2}$ cables south-eastward of Torre Vecchia, in a depth of about 36 feet (11^m0), weed; it is sheltered from north-westerly and westerly winds, but exposed to those from south-eastward.

Torre Grande anchorage is about 11 cables southward of Torre
 50 Grande, in a depth of about 36 feet (11^m0). A vessel approaching from westward or north-westward should round Capo San Marco at a distance of about one mile, and should thence steer about 055°. When Torre Grande bears 005°, it should be steered for, and the vessel should anchor on that bearing, with Torre San Giovanni di Sinis

Chart 3917.

bearing 256°. A vessel approaching from south-westward or southward, should steer for Torre Grande bearing more than 019° and open eastward of the cupola of the church in Cabras; before Torre San Giovanni di Sinis bears 270°, course should be altered for the anchorage. 5
Torre Grande (*Lat. 39° 54' N., Long. 8° 31' E.*) in line with the belfry in Cabras leads westward of the 16-foot (4^m9) shoals southward of the mouth of Fiume Tirso, but close to some 30-foot (9^m1) shoals; a vessel of deep draught should keep westward of this line. A vessel of light draught can anchor closer inshore with Torre Grande bearing 005° 10
and Torre San Giovanni di Sinis bearing 249°, in depths of from 19 to 23 feet (5^m8 to 7^m0), about 4 cables offshore. The anchorage is exposed to south-westerly winds, but these do not usually blow home. Small vessels can obtain anchorage, in depths of about 21 feet (6^m4), about 6 cables southward of Torre Grande. 15

Torre Frasca anchorage is about one mile 012° from Torre Frasca, in depths of 39 feet (11^m9), and is the most sheltered one in the bay during south-westerly winds. Small vessels can anchor, in depths of about 21 feet (6^m4), about 8½ cables north-eastward of Torre Frasca.

Coast.—Dangers.—From Capo Frasca, the coast trends southward and for the first 3½ miles forms the western side of the plateau of Santadi; this plateau falls steeply to the sea, and is densely covered with vegetation, *see* view facing page 201. 20

Chart 161a.

Torre di Flumentorgiu stands about 5 miles southward of Capo Frasca; its top is elevated 200 feet (61^m0). About one mile southward of Torre di Flumentorgiu is Porto Palma (Baia di Flumentorgiu). This cove has a sandy beach at its head, and some rocks off either entrance point; a sunken rock lies off its entrance. At the head of the cove are several buildings connected with a tunny fishery. Tunny nets, 30
see page 27, are laid out annually about 3 miles southward of Torre di Flumentorgiu.

From the southern entrance point of Porto Palma, the coast trends about 13 miles south-south-westward to Capo Pecora and is fringed with rocks. Its northern part is fairly fertile and is cultivated, but 35
its southern part consists of uninhabited dunes. The whole stretch of coast is backed by mountains, the most prominent of which is Monte Arcuentu or Pollice di Oristano, 2,575 feet (784^m9) high, about 5½ miles south-south-eastward of the head of Porto Palma.

Capo Pecora, *see* view facing page 208, is a low projection with an 40
above-water rock close off its extremity. At about 1½ miles inland, Punta del Guardianu rises to an elevation of about 1,565 feet (477^m0). The coast southward of Capo Pecora is high, steep, rocky, fringed by a shoal bank, and in most parts inaccessible, but in it are a few short beaches. 45

Portisceddu is situated, near the mouth of Fiume Mannu, about 1½ miles south-eastward of Capo Pecora; there is anchorage about 2 cables offshore where minerals are shipped.

Buggerru is a mining village in a gorge, about 3½ miles southward of Capo Pecora; the village, in which are furnaces and a tall chimney, is 50
situated at the head of a cove, on the western side of which is a wharf with a depth of 8 feet (2^m4) alongside.

Cala Domestica, about 2 miles south-westward of Buggerru, is a cove whence minerals are shipped. On the western entrance point of the

Chart 161a.

cove is a tower, the top of which is at an elevation of 131 feet (39^m9).

Between Cala Domestica and Capo Altano, about 9 miles southward, the coast forms a bight which is exposed to westerly winds.

- 5 Pan di Zuccherò is a rock, 433 feet (132^m0) high, situated a short distance offshore about 2½ miles southward of Cala Domestica.

Porto Flavia, close north-eastward of Pan di Zuccherò, is visited by vessels to load minerals.

- 10 Masua, close south-eastward of Porto Flavia, is another loading place, but it should not be approached without local knowledge.

Nebida, the grey buildings of which stand on the steep mountain slope southward of Masua, has a small loading wharf below it.

- Fontanamare (*Lat.* 39° 17' N., *Long.* 8° 27' E.), about 2½ miles southward of Masua, consists of some ruined buildings and a prominent
15 white chimney on the slopes of the hills.

- Porto Paglia, at which there is a low, reddish tower, lies about 1½ miles southward of Fontanaamare, and between them is a stretch of white sandy beach. At Porto Paglia are the buildings of a tunny fishery. Tunny nets, *see* page 27, are laid out annually about three-
20 quarters of a mile south-westward of Porto Paglia.

From Porto Paglia, the coast trends about 3½ miles south-westward to Capo Altano; its northern part is fringed by a rocky bank, with depths of from 1½ to 2½ fathoms (2^m3 to 5^m0), extending about 3½ cables offshore.

- 25 **Anchorage.**—In fine weather, vessels with local knowledge can obtain anchorage in the cove on the shore of which is the village of Buggerru.

Cala Domestica affords anchorage to small vessels with local knowledge, but it is dangerous during north-westerly winds.

- 30 Vessels anchor at Porto Flavia in depths of 5 fathoms (9^m1) close inshore. Loading is carried out by means of a chute, under which vessels secure to buoys; though exposed to south-easterly and south-westerly winds, loading can be effected during north-westerly winds.

Chart 3918.

- 35 **CANALE DI SAN PIETRO.—Northern part.—Dangers.**—The northern part of this channel, *see* view facing page 209, separates Isola di San Pietro, *see* page 207, from the mainland, and between it and the southern part, *see* page 208, is a bar which can only be crossed by small vessels, with local knowledge, drawing less than 15 feet
40 (4^m6), *see* page 209.

Capo Altano, on the north-eastern side of the northern end of Canale di San Pietro, is rocky and 347 feet (105^m8) high.

- Isolotto dei Meli (Porri) is 36 feet (11^m0) high, and lies about half a mile westward of Capo Altano; it is connected with the coast east-
45 ward by a rocky shoal with depths of from 23 to 29 feet (7^m0 to 8^m8). The islet is surrounded by rocks, and a rocky shoal extends about 2 cables north-north-westward from it. Isolotto dei Meli and the shoals around it are covered by the *red* sector of the light on Isolotto Ghinghetta (page 206) between the bearings 153° and 165°.

- 50 Tunny nets, *see* page 27, are laid out annually in the vicinity of Capo Altano.

Secca Grande, with a depth of 10 feet (3^m0), rock, lies about 1½ miles south-westward of Isolotto dei Meli and is covered by the *red* sector of

Charts 165, 160, 2158a.

Chart 3918.

the light on Isolotto Ghinghetta (page 206), between the bearings of 100° and 112°.

Secca Martin, with a depth of 23 feet (7^m0), rock, lies about 3½ cables north-eastward of Secca Grande. 5

Secca del Sardo, with a depth of 23 feet (7^m0), lies about half a mile south-eastward of Secca Grande.

Isola Piana, 62 feet (18^m9) high, rocky, and covered with vegetation, lies on the south-western side of the northern end of Canale di San Pietro, about 2½ miles south-westward of Isolotto dei Meli, and on its eastern extremity are the buildings in connection with a tunny fishery and a tall chimney. The island is fringed by a shoal bank extending as much as 2 cables offshore in places, and close off its northern extremity is a steep-sided, above-water rock, named La Catena. 10

Isola dei Ratti (*Lat.* 32° 11' N., *Long.* 8° 19' E.), about 20 feet (6^m1) high, and overgrown, lies on the same shoal as, and about 2 cables southward of, Isola Piana. A shoal bank, on which are some rocks, extends about 2 cables south-eastward from the islet. 15

La Punta, the north-eastern extremity of Isola di San Pietro, is about 4 cables westward of Isolotto dei Ratti. It is the extremity of a level promontory, 66 feet (20^m1) high, and on which are the buildings of a tunny fishery, with a tall chimney. A shoal bank extends eastward from the point to join the bank on which lie Isola Piana and Isola dei Ratti. 20

Tunny nets are laid out annually in the bay close westward of La Punta. See page 27. 25

From Capo Altano, the north-eastern shore of Canale di San Pietro trends about three-quarters of a mile southward to Punta Nigra; it is high and cliffy, and continues so for a further quarter of a mile to the northern entrance point of Porto Paglietta. A shoal bank extends about one cable off the southern entrance point of Porto Paglietta. 30

Portoscuso, a mining and fishing village, stands on the rocky southern entrance point, about 50 feet (15^m2) high, of Porto Paglietta; close westward of the village is a prominent octagonal tower.

Tunny nets are laid out annually in the vicinity of Portoscuso. See page 27. 35

Between Portoscuso and Punta San Jorgi, about 1½ miles south-eastward, the shore is bordered by a bank, which with depths of less than 18 feet (5^m5) extends as much as half a mile offshore in places. 40

Isolotto Ghinghetta, about 4 cables south-westward of Portoscuso, is surrounded with rocks and lies on a shoal between which and the coastal bank there are depths of from 18 to 26 feet (5^m5 to 7^m9).

Porto Vesme, about three-quarters of a mile east-south-eastward of Portoscuso, is the terminus of a railway to the mines. Close eastward of the railway station is the electricity generating station. The port is protected by a mole, on the eastern side of which are a wharf and the entrance of a dredged basin, but it is only available to vessels drawing less than 16 feet (4^m9) with local knowledge. The entrance channel, which in 1948 was dredged to a depth of 21 feet (6^m4), extends about three-quarters of a mile south-south-westward from the head of the mole. On the mole is a 12-ton crane; a small quantity of coal might be obtained. 45 50

Secca Arena, with a depth of 13 feet (4^m0), rock, lies about 1½ miles

Charts 161a, 165, 160, 2158a.

Chart 3918.

south-westward of Isolotto Ghinghetta, and about midway between them is a rocky shoal with a depth of 21 feet (6^m4).

From La Punta, the low, sandy western shore of Canale di San 5 Pietro trends southward for about 2½ miles to Carloforte, and is fronted by extensive shoals, which off the town extend right across the channel.

Punta Grossa is about 1½ miles southward of La Punta, and close northward of it is a group of conspicuous buildings.

Light.—Beacons.—Buoyage.—A light is exhibited, at an elevation 10 of 33 feet (10^m1), from a grey metal framework tower on a masonry base, 26 feet (7^m9) in height, situated on Isolotto Ghinghetta. See view facing page 200.

A beacon stands about three-quarters of a mile north-eastward of the mole head at Port Vesme and another beacon about three-quarters 15 of a mile farther north-north-eastward.

These beacons, in line, bearing 029°, lead through the dredged channel to Porto Vesme.

Two buoys, the outer painted red and the inner painted white, mark the north-western side of the channel leading to Porto Vesme. 20 A light-buoy, painted black and red in horizontal bands, and exhibiting a *white flashing light every four seconds*, is moored close south-eastward of Secca Grande.

Submarine cable.—A submarine cable, the route of which is indicated by a wavy line on the chart, crosses the northern end of 25 Canale di San Pietro. See page 19.

Anchorage.—Directions.—The most sheltered berth during south-easterly and south-westerly winds is, in a depth of 6½ fathoms (11^m9), sand and weed, about 9 cables 150° from the chimney on Isola Piana. A vessel approaching from westward should steer with the 30 tower at Portoscuso bearing 083°, passing between La Catena and Secca Grande. When Torre San Vittorio, see below, bears 191° and is open eastward of the eastern extremity of Isola Piana, she should steer for the tower at Calasetta, see page 209, bearing 162° and slightly open westward of Monte Arbus, see page 210 and view A on chart 1129. 35 When the chimney on Isola Piana is abeam, the vessel should steer for the anchorage given above.

Anchorage can be obtained, in depths of from 7 to 10 fathoms (12^m8 to 18^m3), sand and weed, about 9 cables southward of Isolotto Ghinghetta (*Lat. 39° 11' N., Long. 8° 22' E.*), but it is exposed to north- 40 westerly winds.

Small vessels can obtain temporary anchorage, in depths of from 3½ to 4½ fathoms (6^m9 to 7^m8), southward of Portoscuso, about 2½ cables offshore, but it is exposed to north-westerly winds.

In fine weather, small vessels of light draught, with local knowledge, 45 can obtain anchorage off Porto Vesme.

Carloforte.—Lights.—Beacons.—This town, the only one on Isola di San Pietro, is a fishing centre and southward of it are extensive salt pans. The tower of the church in the middle of the town has an illuminated four-faced clock. A monument stands a quarter 50 of a mile westward of the church tower.

Torre San Vittorio, 43 feet (13^m1) high, stands on Punta San Vittorio 6 cables south-eastward of the church tower. Zinc, lead, and tunny fish are exported. Minor repairs can be effected.

Molo San Vittorio extends about one cable north-eastward from

Charts 161a, 165, 160, 2158a.

Chart 3918.

Punta San Vittorio. Molo della Sanità extends about one cable south-eastward from abreast the northern end of the town. A break-water extends about one cable south-south-eastward from a position about $1\frac{1}{2}$ cables north-north-eastward of the root of Molo della Sanità. 5
Fronting the town is a pier, about three-quarters of a cable long, with depths of from 9 to 16 feet (2^m7 to 4^m9) alongside.

A light is exhibited, at an elevation of 21 feet (6^m4), from a small, circular masonry tower, 18 feet (5^m5) in height, situated on the head of Molo San Vittorio. 10

A light is exhibited, at an elevation of 23 feet (7^m0), from a small, white, circular tower, 18 feet (5^m5) in height, situated on the head of Molo della Sanità.

Two lights, disposed vertically, are exhibited, at elevations of 30 and 24 feet (9^m1 and 7^m3), from a grey iron column on an iron hut, situated 15 on the head of the pier.

Two pyramidal leading beacons, surmounted by circular discs, are situated, the front beacon, which is painted black and white in horizontal bands, on the shore about 4 cables south-eastward of the church tower; and the rear beacon, which is painted white, about 9 cables 20 west-south-westward of the front beacon (*Lat.* $39^\circ 08' N.$, *Long.* $8^\circ 18' E.$). These beacons in line bear 241° .

Buoyage.—A conical buoy, painted black and white in horizontal bands and surmounted by a cone, is moored about 19 cables north-eastward of the church in Carloforte. 25

A conical buoy, painted red and white in horizontal bands, surmounted by a diamond and marked "Carloforte N.," is moored about 16 cables north-eastward of the church.

A buoy in the shape of a truncated cone is moored about $1\frac{1}{2}$ miles north-eastward of the church in Carloforte. 30

A black conical buoy, surmounted by a globe, and a red conical buoy, surmounted by two globes, are moored one on each side of the leading line indicated by the beacons, about $1\frac{1}{2}$ miles east-north-eastward of the church.

A light-buoy, painted black and white in horizontal bands, surmounted by a cone and exhibiting a *red flashing light, every three seconds*, is moored about $13\frac{1}{2}$ cables east-north-eastward of the church. 35

A conical buoy, painted red and white in horizontal bands and surmounted by a diamond, is moored about 8 cables east-north-eastward of the church. 40

A red conical buoy, surmounted by a globe, is moored about $1\frac{1}{2}$ miles eastward of the church.

A conical buoy, painted red and white in horizontal bands, surmounted by a globe and marked "Carloforte S.," is moored about one mile south-eastward of the church. 45

A conical buoy, painted black and white in horizontal bands and surmounted by a cone, is moored about $1\frac{1}{2}$ miles south-eastward of the church.

Anchorage.—**Pilotage.**—There is anchorage, for vessels drawing up to 13 feet (4^m0), with the church and monument in Carloforte in 50 line bearing 273° and the church distant about $8\frac{1}{2}$ cables.

Pilotage is compulsory for vessels of over 300 tons.

Isola di San Pietro.—**Dangers.**—**Light.**—The northern and central portions of this island are rugged, hilly, and only partly culti-

Chart 3918.

vated, but in its southern part are some level spaces where corn, vines, and olive and fig trees flourish.

Monte Guardia dei Mori, the highest hill in the island, rises to an elevation of 692 feet (210^m₉) about 2 miles south-westward of La Punta, and on its summit is a square building.

Monte Riciotto, 272 feet (82^m₉) high, is situated near the south-eastern extremity of the island.

Cala Lunga, about half a mile south-westward of La Punta, has several rocks in its entrance. Tunny nets, *see* page 27, are laid out annually in the vicinity of Cala Lunga.

Punta delle Oche lies about 2 miles westward of La Punta, and about half a cable north-westward of it is a steep-to, 10-foot (3^m₀) patch. Tunny nets, *see* page 27, are laid out annually in the vicinity of Punta delle Oche.

Cala Vinagra, about 1½ miles west-south-westward of Punta delle Oche, is somewhat protected by an islet.

Punta Burrona lies about 2½ miles west-south-westward of Punta delle Oche, and close south-westward of it is Punta Figu, with a 15-foot (4^m₆) patch within one cable westward of it.

Capo Sandalo (*Lat.* 39° 09' N., *Long.* 8° 13' E.), the western extremity of the island, lies about one mile south-south-westward of Punta Burrona, and close off is an islet. *See* view facing this page.

Isolotto del Gallo, is 52 feet (15^m₈) high and steep-to; it lies about half a mile westward of Capo Sandalo, there being a deep passage between.

A light is exhibited, at an elevation of 440 feet (134^m₁), from a white circular tower, with two balconies, surmounting a white two-storied building, 98 feet (29^m₉) in height, situated on Capo Sandalo. *See* view facing page 200.

Punta Spalmatore lies about 2½ miles south-south-eastward of Capo Sandalo, and between them are two bays, the rugged shores of which are fringed with rocks. Spalmatore Grande is the southern of the two bays, and near the middle of its entrance is a 16-foot (4^m₉) rock.

Punta Grossa and Punta delle Colonne are, respectively, about 1½ and 2½ miles south-eastward of Punta Spalmatore. Punta Genia lies about 2 cables eastward of Punta Grossa and between them is a bay the shores of which are bordered by a bank, which, with depths of less than 18 feet (5^m₅), extends as much as 3½ cables offshore, and in which lies a number of rocks with depths of from 6 to 18 feet (1^m₈ to 5^m₅). For clearing marks, *see* page 209.

Punta delle Colonne has some remarkable columnar rocks off it which stand on a rocky shoal projecting about 2½ cables southward from the point.

Buoy.—A red conical buoy marks the edge of the shoal bank extending about 3½ cables south-eastward of Punta Genia.

Canale di San Pietro.—Southern part.—Dangers.—Light.—

The southern part of this channel, *see* view A on chart 161a, separates Isola di San Pietro from Isola di Sant' Antioco, *see* page 210. From Punta delle Colonne, the western shore of the channel trends about 1½ miles northward to Punta Gerino, and is high and indented; northward of Punta Gerino it becomes low and sandy, and is fronted by a shoal bank.

Isolotto Mangiabarca lies on the eastern side of the channel, about

Charts 161a, 165, 160, 2158a.



*Punta dell
Guardiano,
bearing 094°, 9 miles.*
Capo Pecora from westward.



*Isolotto
del Gallo.*
*Lighthouse bearing
000°, 1½ miles.*
Capo Sandalo from southward.
(Originals dated 1883.)

a



Torre
Porto Scuso.

Soglia
la Ghinghella.

Secca
Martin.

Secca
Grande.

a

a

b



Secca
Grande.
a

Isola di Sant'
Antioco.

Torre
Calasetta.

Isola Piana,
bearing 175°, 3 miles.

Torre
San Vittoria.

b

b



b

Monte Guardia
del Mori

Punta
Zenoglio.

Punta
Figu.

View, in three parts, of Canale di San Pietro from northward.
(Original dated 1883.)

Chart 3918.

2½ miles east-south-eastward of Punta delle Colonne, close off a point with which it is connected by a shoal spit on which are some above-water rocks.

A light is exhibited, at an elevation of 31 feet (9^m4), from a white, conical masonry hut, 28 feet (8^m5) in height, situated on the summit of Isolotto Mangiabarca. 5

From abreast the islet, the north-western coast of Isola di Sant' Antioco trends about 2 miles north-north-eastward to Punta Manca and is steep, and rocky, but of no great elevation. It is fringed with rocks, and should not be approached within half a mile. 10

Spiaggia Grande is an indentation entered about half a mile 3 to 9 cables north-north-eastward of Isolotto Mangiabarca; the depths in it are shoal and at the head of it is a prominent group of buildings with a tall chimney. 15

Secca delle Saline, on which are several rocks awash, lies within 2 cables westward of the point separating Spiaggia Grande from another shoal bay farther northward. For clearing marks, *see* below.

Calasetta (*Lat.* 39° 06' N., *Long.* 8° 22' E.) is situated eastward of Punta Manca, and on its western side is a prominent, large, circular tower, 95 feet (29^m0) high; the church has a large white cupola. The landing place, consisting of a masonry mole, about 200 feet (61^m0) long, is close eastward of the white building of the railway station, but the depths alongside it are shoal. 20

Isolotto Francese lies close north-eastward of the town, and from it a spit, with depths of less than 18 feet (5^m5), extends about one-quarter of a mile northward. 25

Eastward of Calasetta, the northern coast of Isola di Sant' Antioco is low and marshy, and is fronted by a shoal bank extending one mile offshore in places. 30

Anchorage.—Directions.—The anchorage for large vessels in the southern part of Canale di San Pietro is preferable to that in the northern part, *see* page 206, for its approach is less difficult, but it is exposed to south-westerly winds, though these are neither frequent nor violent. 35

A good berth is about 2 miles west-south-westward of the tower at Calasetta, in depths of 10 fathoms (18^m3). There is also anchorage, about 1½ miles west-north-westward of the tower, in depths of from 6 to 7 fathoms (11^m0 to 12^m8). 40

A vessel approaching either of the above-mentioned anchorages from south-westward, when in the vicinity of Punta Colonne, will avoid the dangers near that point by keeping the tower at Calasetta bearing less than 069°, and open northward of a hummock on the skyline northward of Monte San Michele, *see* chart 161a and view C on chart 1129. 45

When in the vicinity of Secca delle Saline, a vessel should keep the point off which lies Isolotto Mangiabarca bearing less than 167° and open eastward of Il Toro (page 210).

A vessel crossing the bar from northward should pass westward of Isolotto Ghinghetta and thence steer with the tower at Portoscuso bearing 027°, astern, until the beacons southward of Carloforte are in line, bearing 241°, which leads between the black and red conical buoys, east-north-eastward of the church in Carloforte. When close to the light-buoy, the vessel should steer for the conical buoy, painted black

Charts 161a, 165, 160, 2158a.

Chart 3918.

and white in horizontal bands and surmounted by a cone, situated about one mile southward of the light-buoy, keeping the light-buoy in line, with the northern conical buoy, painted black and white in horizontal bands and surmounted by a cone, bearing about 359°, astern. This track leads through in a least depth of 17 feet (15^m2). The southern buoy may be passed close-to on either side, whence the vessel may steer as requisite.

Charts 3918, 3919.

- 10 **Sant' Antioco.—Channel.**—This town stands on the slope of a hill on the south-western side of the south-eastern arm of Canale di Pietro, which arm separates Isola di Sant' Antioco from the mainland. An ancient fort dominates the town and the church is a prominent feature. Fronting the town is a wharf, which is approached by a channel leading
15 from Canale di Pietro; this channel has been dredged to a depth of 13 feet (4^m0) and is marked by stakes. Wine, grain, cheese and minerals are exported. Foodstuffs, timber and metals are imported.
Chart 3919.

- Isola di Sant' Antioco.—Off-lying islets and dangers.—Lights.**
20 **—Signal station.—Storm signals.**—This island is generally hilly but has numerous tracts of cultivated land. The north-eastern side is connected with the mainland by extensive flats, with depths of less than 6 feet (1^m8), and by a narrow isthmus.

- Monte Perdas de Fogu (*Lat. 39° 02' N., Long. 8° 26' E.*), its highest
25 hill, attains an elevation of 889 feet (271^m0), near the centre of the island, *see* view facing page 212. On the summit of this hill is a small inconspicuous beacon.

Monte Scrocca Mannu, in the northern part of the island, has a pointed summit 479 feet (146^m0) high.

- 30 Monte Arbus, 755 feet (230^m1) high, is the middle and highest of three hills in the southern part of the island.

- From abreast Isolotto Mangiabarca, the western coast of the island trends about 7½ miles south-south-eastward to Capo Sperone, and is rocky, indented, and fringed by a shoal bank extending a short distance
35 offshore. Tunny nets, *see* page 27, are laid out annually about one mile southward of Isolotto Mangiabarca.

- Secca Pomata, a small, detached, rocky patch, with a depth of 46 feet (14^m0), lies about 2¾ miles west-south-westward of Capo Sperone; during westerly gales, the sea breaks heavily on this patch,
40 which should then be avoided.

- Capo Sperone, the southern extremity of Isola di Sant' Antioco, is low and rocky, but is backed by hills. There is a signal station, consisting of a light grey building with a turret, which is open to public correspondence, standing at an elevation of 577 feet (175^m9), about three-
45 quarters of a mile northward of the cape. Storm signals are displayed; *see* page 12.

Il Toro is a steep-to conical islet about 5½ miles southward of Capo Sperone. *See* view B on chart 161a.

- A light is exhibited, at an elevation of 384 feet (117^m0), from a white
50 square masonry building, surmounted by a white circular stone tower, 18 feet (5^m5) in height, situated on the summit of Il Toro.

Isolotto la Vacca, about 2 miles south-eastward of Capo Sperone, is 312 feet (95^m1) high and fringed with rocks, especially at its northern and south-western ends, some of which are above water; the highest of

Charts 161a, 165, 160, 2158a.

Chart 3919.

these rocks, Scoglio Vitello, lies about one cable northward of the northern extremity of the islet. *See* view facing page 212. The islet and the dangers round it are covered by the *red* sector of the light on Il Toro, between the bearings 199° and 205°. 5

Secca della Vacca, with a depth of one foot (0^m3), lies 3½ cables offshore, about one mile eastward of Capo Sperone; there is a deep channel between this shoal and Isolotto la Vacca, but that between it and the coast is foul. Monte Orri, *see* chart 161a, bearing 041° and slightly open south-eastward of Monte Narcao, leads about 4 cables 10 south-eastward of Secca della Vacca, *see* view C on chart 161a. A masonry beacon, in the form of a truncated cone, painted black and white in horizontal bands, surmounted by a black cylinder, stands on Secca della Vacca.

GOLFO DI PALMAS.—Dangers.—This bay is entered between 15 Capo Sperone and Capo Teulada, *see* page 213, about 11½ miles south-eastward, and is formed between the south-eastern coast of Isola di Sant' Antioco and the southern end of the western coast of Sardinia. On either side its shores are hilly, but at its head are extensive salt-water lagoons and the isthmus between Isola di Sant' Antioco and the 20 mainland. The only off-lying dangers are Secca della Vacca and Secca di Cala Piombo, *see* below.

Torre Canai, 95 feet (29^m1) high, stands on Punta Canai, a low rocky point about 1½ miles east-north-eastward of Capo Sperone. Northward of it are Cala Francese and Calanca Maladroxa. 25
Charts 3919, 3920.

Cala Aligosta, on the northern side of Capo Teulada (*Lat.* 38° 52' N., *Long.* 8° 39' E.), is a cove the head of which is foul.

Cala Piombo, close northward of Cala Aligosta, is free from dangers and its shores can be approached to about one cable, except at its 30 head which is shoal. *See* view facing page 213.

Torre di Cala Piombo, the top of which is elevated 633 feet (192^m9), stands on the northern side of Cala Piombo.

Secca di Cala Piombo, with a depth of less than 6 feet (1^m8), lies about 6 cables west-north-westward of Punta di Cala Piombo, with 35 deep water between.

Porto Pino is entered between Punta di Cala Piombo and Punta Zari, about 3½ miles northward. The southern part of the shore of this bay is rocky and fringed by a shoal bank extending a short distance offshore, but the northern part consists of sand dunes backed by extensive 40 salt-water marshes.

Punta Zari, 102 feet (31^m1) high, is covered with vegetation, and shows up well against the whitish dunes behind it, especially from westward. On its summit stands a white hut.

Chart 3919.

Punta di Porto Botte lies about 3½ miles northward of Punta Zari, and the shore between is rocky and backed by low hills covered with vegetation. 45

Porto Botte is entered between Punta di Porto Botte and a low point about 2 miles north-north-westward. It is shoal and its shores are 50 backed by marshes. A shoal bank extends about half a mile from the northern entrance point. At the head of the bay, about three-quarters of a mile eastward of its northern entrance point, is a wooden pier,

Charts 161a, 165, 160, 2158a.

Chart 3919.

connected with the railway system, whence charcoal is shipped. Near the pier are some buildings, with large deposits of charcoal close to them.

- 6 At the head of Golfo di Palmas is the low and sandy isthmus connecting Isola di Sant' Antioco with the mainland. Depths of less than 6 fathoms (11^m0) extend as much as 1½ miles from this part of the shore.

Anchorage.—Caution.—Although Golfo di Palmas is open southward, the seas raised by winds from that direction do not reach the anchorages, nor does the wind blow home.

The holding ground is better on the eastern side of the bay than on its western side.

- 15 Anchorage can be obtained off Calanca Maladroxa, in a depth of about 8 fathoms (14^m6). Small craft can anchor closer inshore in a depth of about 2½ fathoms (5^m0).

Cala Piombo (*Lat.* 38° 53' N., *Long.* 8° 38' E.) affords excellent shelter from north-easterly and south-easterly winds, in depths of from 6 to 10 fathoms (11^m0 to 18^m3).

- 20 Porto Pino affords anchorage in depths of 6½ or 7 fathoms (11^m9 or 12^m8), good holding ground, with Punta Zari bearing 270°, and Torre di Cala Piombo bearing 164°, but caution is necessary for the edge of the coastal bank is steep-to. This anchorage is sheltered from north-easterly winds, and partly so from south-easterly winds, but should
25 it begin to blow hard from south-westward or north-westward a vessel should put to sea.

- Porto Botte affords good shelter from north-easterly winds, about 1½ miles north-westward of Punta di Porto Botte, in a depth of 5½ fathoms (10^m1), weed, but the depths are slightly less close northward and southward of this position.

- The nearest anchorage to the town of Sant' Antioco is at the head of the bay, in depths of 5 fathoms (9^m1), weed, with the easternmost building in the town in line with the bridges in the isthmus, *see* below, bearing about 319°, and the beacon on Monte Perdas de Fogu bearing
35 about 245°.

- Porto Ponte Romano.**—This harbour lies at the western end of the head of Golfo di Palmas. It consists of a wharf which is protected by a breakwater. The north-eastern side and the head of this wharf have depths of 26 feet (7^m9) alongside, and it is approached through
40 a channel, about 200 feet (61^m0) wide, which, in 1950, had been dredged to a depth of 26 feet (7^m9). A quay, with a depth of 18 feet (5^m5) alongside, extends about three-quarters of a cable from a position close eastward of the root of the wharf.

- Lights.**—A light is exhibited, at an elevation of 20 feet (6^m1), from
45 an iron column on a quadrangular masonry hut, 25 feet (7^m6) in height, situated on the south-eastern corner of the wharf.

- A light is exhibited, at an elevation of 36 feet (11^m0), from a turret on the north-western angle of a yellow building, 33 feet (10^m1) in height, situated about 2 cables northward of the light-column on the
50 wharf.

Light-buoys.—The north-eastern side of the dredged channel is marked by three light-buoys, painted black and exhibiting, the outer buoy, a *green flashing light every five seconds*, the middle buoy a *green fixed light* and the inner buoy a *green flashing light, every three seconds*.

Charts 161a, 165, 160, 2158a.

To face page 212.,

Monte Linas.

a

Capo
Pecora.

Capo Sandalo
lighthouse,
bearing 030°,
about 9 miles.

Isola San
Pietro.

Monte
Guardia
dei Mori.

Monte
Ricciotto.

a

a

Monte San
Michele.

Monte
Scrocca
Mannu.

Isola San'
Antioco.

b

a

b

b

Monte
Arous.

Isolato
La Vacca. *Capo
Tenuada.*

Il Toro.

View, in three parts, of the southern part of the western side of Sardinia.
(Original dated 1883.)



*Torre di
Cala Piombo.*

*Capo
Teulada.*

*Capo Spartivento
lighthouse, bearing
081°, 19 miles.*

Capo Teulada and Capo Spartivento from west-south-westward.

0



*Capo Teulada,
bearing 282°,
about 5 miles.*

*Torre
di Cala
Piombo.*

*Cala
Brigantina.*

*Porlo
Scudo.*

*Isola
Rossa.*

*Torre del
Budello.*

3

2



1

*Torre
Malfitano. Capo
Malfitano.*

*Capo Spartivento
lighthouse.*

View, in two parts, of Golfo de Teulada from south-eastward.

(Originals dated 1833.)

Chart 3919.

The south-western side is marked by three light-buoys, painted red and exhibiting, the outer buoy a *red flashing* light *every five seconds*, the middle buoy a *red fixed* light and the inner buoy a *red flashing* light, *every three seconds*. 5

Chart 161a. (See caution on page 196.)

SOUTHERN SIDE OF SARDINIA.—General remarks.—The southern coast of Sardinia extends from Capo Teulada to Capo Carbonara, about 43 miles east-north-eastward; its western half is backed by high mountains, and its eastern part forms a large bay. In most 10 places, the coast is fairly steep-to, and there are no dangers more than $1\frac{1}{2}$ miles offshore. See view B on chart 161a.

Chart 3920.

Golfo di Teulada.—This bay, *see view* facing this page, is entered between Capo Teulada and Capo Malfatano, about $7\frac{1}{2}$ miles eastward. 15 On its western side are Cala Brigantina and Porto Scudo, at its head is Porto Teulada, and on its eastern side, between Isolotto Campiona, an inconspicuous islet, 68 feet (20^m7) high, and Torre Pixini, 49 feet (14^m9) high, is another cove. The eastern shore of the bay is hilly and barren, and should not be approached within about one cable. 20

Capo Teulada (*Lat.* $38^\circ 52' N.$, *Long.* $8^\circ 38' E.$) is the extremity of a hilly peninsula, the seaward sides of which rise steeply to elevations of from 350 to 738 feet (106^m7 to 224^m9). Its coasts are steep-to and much indented, and it is joined to the mainland northward of it by a low sandy isthmus. 25

Cala Brigantina, on the eastern side of the isthmus, is open south-eastward, and its head is bordered by a shoal bank extending about $1\frac{1}{2}$ cables offshore.

Porto Scudo is entered close north-north-eastward of Cala Brigantina, from which it is separated by a steep promontory, 541 feet (164^m9) high; on the south-eastern shoulder of the promontory stands a prominent tower, the top of which is elevated 472 feet (143^m9). The cove is open south-eastward, and the depths in it decrease rapidly from 7 fathoms (12^m8) in its entrance.

Detached rocks, with a depth of 9 feet (2^m7), lie about $5\frac{1}{2}$ cables 35 east-south-eastward of the north-eastern entrance point of Porto Scudo.

Chart 1128, plan of Port Teulada.

Isola Rossa, rocky, 177 feet (53^m9) high, and reddish in colour, lies at the head of Golfo di Teulada about half a mile southward of 40 Punta Niedda, the western entrance point of Porto Teulada. From south-eastward it appears saddle-shaped, but from south-westward only one hillock is visible.

Punta Niedda is fringed by a shoal bank extending as much as three-quarters of a cable offshore; the cove on its western side is 45 shoal.

Porto Teulada affords shelter from north-easterly and north-westerly winds. Its eastern shore is fairly steep-to, but on its western side there is a shoal, with a depth of 19 feet (5^m8), rock, about $3\frac{1}{4}$ cables east-north-eastward of Punta Niedda. At the head of the bay, north-eastward of a point on which stands Torre del Budello, is a shoal 50 cove. Torre del Budello is 75 feet (22^m9) high, circular and of a light colour.

Charts 165, 160, 2158a.

Chart 3920.

Anchorage.—Cala Brigantina affords anchorage, sheltered from south-westerly and north-westerly winds, in the middle of the cove, in depths of 45 feet (13^m7).

5 *Chart 1128, plan of Port Teulada.*

Anchorage can be obtained in the approach to Porto Teulada, in depths of from 9 to 13 fathoms (16^m5 to 23^m8), about midway between the steep-to eastern extremity of Isola Rossa and Punta Niedda.

- Porto Teulada affords anchorage, in a depth of about 9 fathoms (16^m5), with Torre del Budello bearing 319°, distant about 3 cables, and the tower near Porto Scudo in line with the extremity of Punta Niedda, bearing about 239°. Small craft can anchor, in a depth of 4 fathoms (7^m3), about 1½ cables eastward of Torre del Budello.

Chart 1128, plan of Port Malfatano.

- 15 **Porto Malfatano.**—This bay is entered between Capo Malfatano and Isolotti Ferragliani, about one mile eastward, and the surrounding country is hilly and sterile. The neighbourhood is unhealthy.

Capo Malfatano is the extremity of a narrow, steep-sided peninsula, 219 feet (66^m7) high, and is surmounted by a tower.

- 20 Isolotti Ferragliani are connected with the shore by a shoal bank. At the head of the bay, about three-quarters of a mile north-westward of Isolotti Ferragliani, lies Isola Teredda, 102 feet (31^m1) high, and connected with the shore by a shoal bank. Close south-south-westward of Isola Teredda (*Lat.* 38° 53' N., *Long.* 8° 49' E.) is an above-water
25 rock.

In the north-western corner of the bay is a cove which is very shallow, and has a rock, with a depth of less than 6 feet (1^m8), close northward of its western entrance point.

- Anchorage.**—Temporary anchorage can be obtained in Porto
30 Malfatano, in a depth of about 8 fathoms (14^m6), weed, 2½ cables east-north-eastward of the tower above Capo Malfatano. Small vessels, with local knowledge, can anchor in the entrance of the cove at the head of the bay, in a depth of 3½ fathoms (5^m9), weed, with the southern extremity of Isola Teredda in line with the eastern entrance
35 point of the cove.

Chart 3920.

- Capo Spartivento.—Dangers.—Light.**—This cape, *see* views facing pages 213 and 220, lies 2½ miles east-south-eastward of Capo Malfatano, and is rocky and steep; the coast in its vicinity should not
40 be approached within three-quarters of a mile. Several islets and rocks, amongst which are Isolotti Padiglioni, lie close inshore between the cape and Isolotti Ferragliani; about 2 cables southward of the cape is a shoal with a depth of 11 feet (3^m4).

- Secca Giudeo, with a depth of 41 feet (12^m5), lies about half a mile
45 eastward of the cape and the same distance offshore.

A light is exhibited, at an elevation of 267 feet (81^m4), from a square, red tower, surmounting a two-storied red building, 64 feet (19^m5) in height, situated about three-quarters of a mile westward of the extremity of Capo Spartivento. *See* view facing page 200.

- 50 Isolotto Giudeo, rocky and dark in colour, lies close inshore about 3½ cables north-eastward of Capo Spartivento, and behind it is a stretch of very light-coloured sand that shows up well from south-eastward.

Signal station.—Storm signals.—A signal station stands at an

Charts 161a, 676, 165, 160, 2158a.

Chart 3920.

elevation of 679 feet (207^m0), about half a mile northward of Capo Spartivento lighthouse. Storm signals are displayed; *see* page 12.

Coast.—Light.—From Capo Spartivento, the coast trends about 9½ miles north-eastward to Capo di Pula, and consists for the most part of sandy beaches with sunken rocks off them; it should not be approached within one mile. Within the coast, the land is mostly low, but it is backed by mountains.

Torre di Chia, the top of which is elevated 144 feet (43^m9), stands on a small, rocky promontory about 1½ miles north-eastward of Capo Spartivento. This promontory appears bare and rocky from south-westward, but overgrown with bushes from north-eastward. On the north-eastern side of the promontory lies Cala Chia, a shallow cove, bounded on its north-eastern side by Isolotto Chia, which lies close inshore, is about 50 feet (15^m2) high, and is difficult to distinguish.

Torre di Cala d'Ostia, 23 feet (7^m0) high, stands on a point about 5 miles north-eastward of Torre di Chia, and about three-quarters of a mile north-eastward of it is the village of Santa Margherita, in which there is a church. About one mile south-westward of Torre di Cala d'Ostia, a rocky spit extends offshore for about 3½ cables.

Capo di Pula is the south-eastern extremity of a rocky peninsula, conical in shape, dark in colour and 115 feet (35^m0) high; it is joined to the mainland by a low sandy isthmus, and close off it lies Isolotto Coltellazzo, a rocky islet of the same colour. On the isthmus are the remains of a Roman amphitheatre, and close northward of them is the church of Sant' Efsio. On the western side of the peninsula is Porto di Pula, surrounded by marshes and only available to small craft with local knowledge.

Torre San Efsio (*Lat.* 38° 59' N., *Long.* 9° 02' E.) is a prominent white, two-storied circular tower on Capo di Pula, which is itself surrounded by a masonry hut, the top of which is elevated 157 feet (47^m8).

A light is exhibited, at an elevation of 52 feet (15^m9), from Torre San Efsio.

Chart 3921.

GOLFO DI CAGLIARI.—Dangers.—This bay is entered between Capo di Pula and Capo Carbonara, about 25 miles east-north-eastward. The two sides of the bay are mountainous, but at its head is a long stretch of sandy shore broken only by the promontory of which Capo Sant' Elia, *see* page 27, is the southern extremity. Behind these sandy beaches are extensive salt-water lagoons and marshes, and farther inland is a well-watered, fertile, and cultivated plain.

Charts 3920, 3921.

Isolotto San Macario, near the northern extremity of which stands a prominent tower, is fairly steep-to on its eastern side, and lies on a shoal bank which, with depths of less than 18 feet (5^m5), extends about 3½ cables offshore about 1½ miles north-north-eastward of Capo di Pula. The village of Pula is situated, about one mile inland, west-north-westward of the islet, and near it stands a castle.

Punta Zavorra lies about 3 miles north-north-eastward of Isolotto San Macario, and between them the shore consists of sandy beaches, separated by rocky points, with several rocks lying close inshore. Punta Furcadizzu (Perda Sale) and Punta Perd'e Sali (Zepera) lie,

General charts 161a, 676, 165, 160, 2158a.

Charts 3920, 3921.

respectively, about half a mile and $1\frac{1}{2}$ miles northward of Isolotto San Macario, and about three-quarters of a mile farther north-north-eastward is Torre del Diavolo, standing on the hillside at an elevation of about 164 feet (50^m0). Punta Zavorra is dominated by a hill covered with vegetation.

Chart 3921.

Torre Antigori, about $2\frac{1}{4}$ miles north-westward of Punta Zavorra, is in ruins, but about half a mile northward of it is a prominent group of reddish-coloured buildings with two tall chimneys.

Orri, a small village about $1\frac{1}{2}$ miles northward of Torre Antigori, is not visible from seaward; about three-quarters of a mile east-north-eastward of it is a detached shoal, with a depth of 13 feet (4^m0).

Charts 3920, 3921.

15 Anchorages.—During north-westerly winds, anchorage can be obtained off Cala di Sant'Efisio, about 4 cables southward of Isolotto San Macario, in a depth of about 9 fathoms (16^m5).

Temporary anchorage can be obtained, in depths of from 7 to 10 fathoms (12^m8 to 18^m3), about three-quarters of a mile offshore, anywhere between Isolotto San Macario and Torre del Diavolo.

Chart 3921.

Rada di Cagliari and approaches.—Dangers.—Lights.—

Buoyage.—Torre Loi, on the shore about $2\frac{1}{2}$ miles northward of Torre Antigori, *see* chart 3921, is about 30 feet (9^m1) high, and is surrounded by dense vegetation. About one mile eastward of Torre Loi is a small detached $2\frac{1}{2}$ -fathom (4^m1) patch. This part of the coast is fronted by a bank, with depths less than 3 fathoms (5^m5), extending as much as one mile offshore.

La Maddalena (*Lat. 39° 09' N., Long. 9° 02' E.*) is a prominent group of buildings about $1\frac{1}{2}$ miles north-north-eastward of Torre Loi.

Rada di Cagliari is entered between La Maddalena and Capo Sant'Elia, about 6 miles east-north-eastward.

From La Maddalena, the shore trends about 5 miles north-eastward to Torre della Scaffa, and is low, sandy, and backed by Stagno di Cagliari. It is fronted by a shoal bank, which, with depths of less than 6 fathoms (11^m0), extends as much as $1\frac{1}{2}$ miles offshore.

Stagno di Cagliari is shallow and abounds in fish; in it are several islets, on the largest of which, near the north-eastern end of the lake, stands the chapel of San Simone. It is connected with the sea by a number of shallow channels spanned by bridges, that over the north-easternmost channel, close westward of Torre della Scaffa, being the most easily identified.

Torre della Scaffa is not easily identified; between it and the sea are several small buildings, and eastward of it are some prominent cement works.

A light, for the use of aircraft, is exhibited from a position about $2\frac{1}{4}$ miles north-westward of Torre della Scaffa.

Nuovo Molo di Ponente is the western outer breakwater at Porto di Cagliari and extends about $8\frac{3}{4}$ cables south-eastward from the shore near Torre della Scaffa. Its south-western side is bordered by a bank, with depths of less than 3 fathoms (5^m5). A passage for lighters has been made through the north-western part of this breakwater.

A light is exhibited, at an elevation of 30 feet (9^m1), from a circular masonry tower, 28 feet (8^m5) in height, situated on the head of Nuovo

Charts 161a, 676, 165, 160, 2158a.

Chart 3921.

Molo di Ponente. This light is obscured over the shoal water south-westward of the breakwater, when bearing more than 041° , but is visible in the outer part of the shoal bank off Torre Loi.

A conical light-buoy, surmounted by a small framework structure, painted black and exhibiting a *green flashing* light *every three seconds*, is moored on the eastern side of the entrance about 4 cables eastward of the head of Nuovo Molo di Ponente.

Buoys for the use of vessels correcting compasses lie about one mile south-westward of the head of Nuovo Molo di Ponente.

Capo Sant' Elia is a prominent feature of whitish chalk and from certain directions appears as an island on account of the low marshy land behind it. Near its eastern extremity stand Torre Sant' Elia and Torre del Poetto, the tops of which are elevated 446 feet (135^m9) and 285 feet (86^m9), respectively. Torre Bocario stands about $1\frac{1}{2}$ miles northward of Torre del Poetto, and on the shore between them is a large seaside resort, with a race-course at the northern end. On the western side of Capo Sant' Elia is Forte Sant' Ignazio, a small grey building, at an elevation of 308 feet (93^m9), with an old tower and the lighthouse southward of it. At the foot of the hill, westward of the fort, is the prominent, light-coloured building, with a red roof, of the lazaretto. On the southern side of the cape are two coves, the western of which is Cala Mosca.

A light (*Lat.* $39^{\circ} 11' N.$, *Long.* $9^{\circ} 09' E.$) is exhibited, at an elevation of 239 feet (72^m8), from a yellow circular tower, with two balconies, surmounting a yellow, two-storied building, the whole 77 feet (23^m5) in height, situated on Capo Sant' Elia. There is a signal look-out station close to the lighthouse.

A detached shoal with a depth of $4\frac{1}{2}$ fathoms (8^m7) lies about 2 cables offshore one mile east-south-eastward of Capo Sant' Elia lighthouse.

Detached shoals, with depths of from $4\frac{1}{2}$ to 6 fathoms (8^m2 to 11^m0), lie within $1\frac{1}{2}$ miles west-south-westward and westward of Capo Sant' Elia lighthouse.

Scoglio Perdaliado, a prominent above-water rock, lies on the extremity of a shoal spit about $2\frac{1}{2}$ cables westward of the lighthouse.

The shore between the lazaretto and the city of Cagliari is low and marshy, and is fronted by a shoal bank extending 4 cables offshore in places. The white cupola of Bonaria convent, about $1\frac{1}{2}$ miles north-westward of the lazaretto, is prominent.

In 1949, Nuovo Molo di Levante extended about $3\frac{1}{2}$ cables westward from a position on the shore about $6\frac{1}{2}$ cables north-westward of the Lazaretto.

In 1949, there were depths of from 18 to 36 feet (5^m5 to 11^m0), in the outer harbour.

For the shore of Golfo di Cagliari eastward of Torre Bocario, *see* page 219.

Anchorage.—Anchorage can be obtained, in a depth of 10 fathoms (18^m3), with Torre dello Elefante, *see* page 218, bearing 011° , and Forte Sant' Ignazio bearing about 085° ; this anchorage is safe in all weathers.

Submarine cables.—Anchorage is prohibited in the area, the limits of which are indicated on the chart by pecked lines, north-eastward of Capo Sant' Elia owing to the existence of submarine telegraph cables, *see* page 19.

Charts. 161a, 676, 165, 160, 2158a.

Charts 1130, 3921.

Porto di Cagliari. — **Light-buoy.** — **Lights.** — Cagliari (*Lat. 39° 13' N., Long. 9° 06' E.*) is the capital of Sardinia ; in the city are the remains of ancient fortifications.

- 5 Torre San Pancrazio, in the northern and highest part of the city, is prominent ; on its south-western corner is a turret. About $1\frac{1}{4}$ miles north-north-eastward of Torre San Pancrazio the square Eastezio di San Michele, with four towers, rises like an island from the plain.

Torre dello Elefante is prominent, though it is not so high as Torre San Pancrazio ; it is situated near the middle of the city, and is a square, reddish-coloured, battlemented building, that has the appearance of two towers joined together, the western one being the higher.

In the western part of the city are numerous tall chimneys.

- 15 The principal exports are salt, charcoal, wine, porcelain clay, cork, wool, milk products, lead, cattle, corn, and flour. There are several factories in the city.

Chart 1130.

The outer harbour is protected by Nuovo Molo di Ponente and Nuovo Molo di Levante, and has depths of from 18 to 36 feet (5^m5 to 20 11^m0). The north-eastern part is shoal and the south-western edge of this bank is marked by a conical light-buoy painted black and exhibiting a *green flashing light every three seconds*. The inner harbour is protected by Vecchio Molo di Levante and Molo Sabauda, and has depths of from 25 to 36 feet (7^m6 to 11^m0).

- 25 A light is exhibited, at an elevation of 29 feet (8^m8), from a circular masonry tower, 28 feet (8^m5) in height, situated on the head of Nuovo Molo di Ponente.

A light is exhibited, at an elevation of 26 feet (7^m9), from a cylindrical masonry tower, 23 feet (7^m0) in height, situated on the head of Vecchio 30 Molo di Levante.

A light is exhibited, at an elevation of 29 feet (8^m8), from a cylindrical masonry tower, 21 feet (6^m4) in height, situated on the head of Molo Sabauda.

- In the north-eastern part of the harbour is a basin for small craft. 35 On the south-eastern and north-western sides of the basin, respectively, are the port office and the custom house, and on the southern side of the entrance is the pilots' office. The head of the basin is being reclaimed.

Ponte della Dogana and Ponte della Sanità are connected with the 40 railway system, and there is a yellow railway station near the head of the former.

Pilotage.—Pilotage is compulsory. The pilot will board vessels about a quarter of a mile outside the harbour entrance. *See page 20.*

- Submarine cable.**—A submarine cable is landed at the head of 45 Vecchio Molo di Levante. Anchoring and fishing in its vicinity is prohibited. *See page 19.*

Port facilities.—**Communication.**—There is a hospital in Cagliari. For deratisation *see page 22.*

- Limited supplies of fresh provisions are available ; water is laid on 50 to the wharves but drinking water is limited in quantity especially during the summer.

Coal and fuel oil can be obtained, and minor repairs effected. There are numerous cranes, one of 20 tons capacity.

Regular steamer communication is maintained with ports in Italy.

Charts 3921, 161a, 676, 165, 160, 2158a.

Chart 1130.

For radio communication, *see* page 21.

Climatic table.—*See* page 53.

Chart 3921.

Eastern shore of Golfo di Cagliari.—Quartu Sant' Elena (*Lat.* 5
39° 14' N., *Long.* 9° 12' E.) lies one mile inland about 2 miles north-
north-eastward of Torre Bocani, *see* page 217, and in it is a white
cathedral with a red roof, the belfry and cupola of which are prominent
objects.

Seno di Quartu is entered between Capo Sant' Elia and Torre Foxi, 10
10 feet (3^m0) high, about 4 miles east-north-eastward. It has a sandy
beach, behind which is Stagno di Quartu, and other lagoons; farther
inland the country is undulating and fertile. The bay is not recom-
mended as an anchorage for it is open and the holding ground is not
good. About 2 miles east-south-eastward of Torre Bocario is a 15
detached 28-foot (8^m5) patch. Torre Carcangiolas, low, circular and
whitish, and Fortezza di Quartu are situated near the shore, about
2 and 3 miles east-north-eastward, respectively, of Torre Bocario.

From the low overgrown point on which stands Torre Foxi, the
eastern shore of Golfo di Cagliari trends about 10½ miles east-south- 20
eastward to Capo Boi. The northern part of this stretch of coast is
fringed by a shoal bank extending about 3½ cables offshore, but its
southern part is fairly steep-to, though fringed with rocks in places.

Torre Sant' Andrea, 16 feet (4^m9) high, with a church close north-
ward of it, Torre Mortorio, on a low rocky point, Torre di Cala Regina, 25
on a steep rocky projection, 170 feet (51^m8) high, and Torre Finocchio,
on a hill 285 feet (86^m9) high, lie, respectively, about 1½, 4, 5½, and
8 miles east-south-eastward of Torre Foxi. South-eastward of Torre
di Cala Regina, the shore is backed by the foothills of the mountains,
and along it are some stretches of sandy beach separated by rocky 30
points.

Baia di Carbonara.—**Dangers.**—**Light.**—**Buoy.**—This bay is
entered between Capo Boi and Capo Carbonara, about 4½ miles south-
eastward; its head is fringed by a shoal bank extending as much as
2 cables offshore in places. Capo Boi is the termination of a small 35
rocky promontory which rises to an elevation of 390 feet (118^m9),
and on which stands Torre Boi.

Isolotti Pescatelli lie 2½ cables offshore about 1½ miles eastward of
Capo Boi, and about 4 cables south-south-westward of them lies Secca 40
dei Pescatelli, with a depth of 11 feet (3^m4). The light at the head of
Baia di Carbonara, *see* page 220, is obscured over this shoal when bear-
ing more than 058°. Torre Giunco, *see* page 259, bearing 090° and
well open southward of Isolotto San Stefano, *see* page 220, leads south-
ward of this shoal.

Monte Marias, 1,932 feet (588^m9) high, is situated about 1½ miles 45
inland nearly 3 miles north-eastward of Capo Boi; its sides rise gently
to a central peak which is easily identified.

Capo Carbonara is the extremity of a rocky peninsula, joined to the
mainland by a low sandy isthmus, which slopes gradually to the sea
and ends in steep rocks. On the summit of the peninsula, at an eleva- 50
tion of 380 feet (115^m8), is Torre Caterina, at which there is a signal
station open to public correspondence.

Monte dei Sette Fratelli, *see* page 259, is an excellent distant land-
mark when off this part of the coast.

Charts 161a, 676, 165, 160, 2158a.

Chart 3921.

Fortezza Vecchia surmounts a salient rocky point about three-quarters of a mile north-north-westward of Torre Caterina.

Secca di Cala Caterina, with a depth of 16 feet (4^m9), rock, is a detached shoal, with a 42-foot (12^m8), rocky patch 3 cables eastward of it, lying about 1½ miles westward of Isola dei Cavoli, *see* below, and nearly 1½ miles south-south-westward of Torre Caterina. It is marked on its north-eastern side by a conical buoy, painted in red and white horizontal bands, with a white spherical topmark. The shoal is covered by the *red* sector of the lower light on Isola dei Cavoli (*see* below), between the bearings 076° and 093°; and the light at the head of Baia di Carbonara is obscured over it when bearing less than 009°. Fortezza Vecchia bearing about 025° and well open eastward of Monte Bruncu Onnos, about 1½ miles northward, leads westward of the shoal. Torre Finocchio bearing 305°, and visible over the extremity of Capo Boi, leads about 2 cables north-eastward of the shoal.

Isolotto San Stefano, about 60 feet (18^m3) high, and surrounded by rocks, lies about 2½ cables south-westward of Fortezza Vecchia, and between it and the extremity of Capo Carbonara numerous rocks and shoals lie within 3½ cables of the coast.

A light (*Lat.* 39° 08' N., *Long.* 9° 31' E.) is exhibited, at an elevation of 43 feet (13^m1), from a white framework structure, 15 feet (4^m6) in height, situated at the head of Baia di Carbonara.

For a description of the coast north-eastward of Capo Carbonara, *see* page 259.

Anchorage.—Baia di Carbonara affords anchorage in depths of 11 or 8 fathoms (20^m1 or 14^m6), sand, respectively, about 8½ cables west-north-westward and 4½ cables north-westward of Fortezza Vecchia. Coasting vessels call regularly, but during south-westerly winds they anchor in Porto Giunco, *see* page 259.

Isola dei Cavoli.—**Dangers.**—**Light.**—This island, about 3½ cables south-eastward of Capo Carbonara, is low, rocky, and partly covered with bushes. It is surrounded by rocks and shoals, especially on its south-western, north-western, and south-eastern sides, and should not be approached within 3 cables. The passage between the island and the cape has depths of 8 or 9 fathoms (14^m6 or 16^m5), but a bank with depths of less than 18 feet (5^m5) extends about 2 cables from the north-western coast of the island, and a detached 12-foot (3^m7) patch lies about 3 cables north-westward of the western extremity of the island.

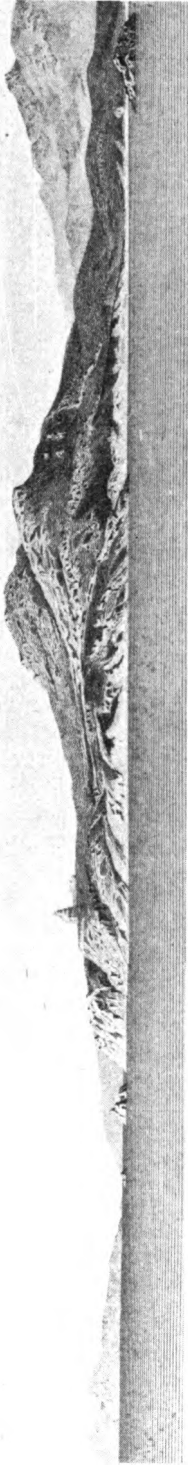
A light is exhibited, at an elevation of 243 feet (74^m1), from a white circular tower, with two balconies, surmounting a three-storied building, painted black and white in horizontal bands and inscribed *Faro di Cavoli*, 123 feet (37^m5) in height, situated on Isola dei Cavoli. Distress signals, *see* page 13, are exhibited at this lighthouse. *See* view facing page 200.

An auxiliary light is exhibited, at an elevation of 174 feet (53^m0), from the above lighthouse.

Submarine cable.—A submarine cable is landed on the north-western coast of Isola dei Cavoli. Anchoring and fishing in its vicinity are prohibited. *See* page 19.

Caution.—*See* caution concerning chart 161a on page 196.

Charts 161a, 676, 165, 2158a.



*Capo
Tetiada.*

*Isolotti
Pudighone.*

*Capo Spartivento
lighthouse, bearing
288°, about 2 miles.*

*Isolotto
Grudeo.*

Capo Spartivento from eastward.



*Capo
Crabara.
Scomunica.*

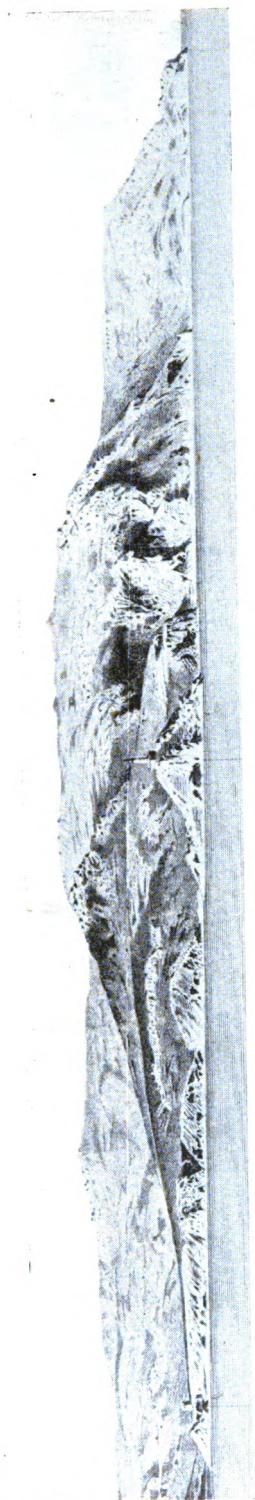
*Monte
Castellaccio.*

*Isola
Piana.*

*Punta
Falcone.*

*Tower,
bearing
079°, 6½ miles.*

Isola Asinara from south-westward.
(*Originals dated 1883.*)



*Capo
Crabara.*

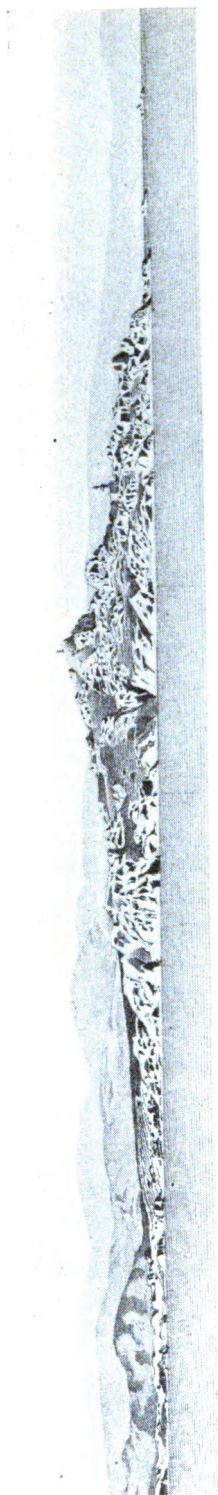
*Monte
Scomunica.*

*Punta Cabrara
lighthouse,
bearing 212°, 2½ miles.*

Isola Asinara from north-eastward.

*Monte Maestra
Serra.*

Torre Arena.



*Lighthouse,
bearing 199°, 2 miles.*

Capo Testa from north-north-eastward.

(Originals dated 1880.)

CHAPTER VI

SARDINIA—NORTHERN AND EASTERN SIDES

Chart 161b.

NORTHERN SIDE OF SARDINIA.—General remarks.—The northern coast of Sardinia extends from Capo Falcone, *see* page 196, to Capo Ferro, *see* page 242, and off either end of it lie islands, those at the eastern end being in or near Bonifacio strait, which separates the islands of Sardinia and Corsica, *see* page 226.

Chart 3916.

Isolotto della Pelosa (*Lat.* 40° 58' N., *Long.* 8° 13' E.) lies south-eastward of Capo Falcone, in Passaggio della Pelosa which is available to small craft with local knowledge only, between the peninsula of which Capo Falcone is the northern extremity and Isola Piana.

Isola Piana, 79 feet (24^m1) high at its northern end, has a dark cylindrical tower on its north-eastern side. Passaggio dei Fornelli, the channel northward of the island, is marked by masonry leading beacons, painted black and white in horizontal bands, and has a depth of 10 feet (3^m0), but it is only available to vessels with local knowledge in fine weather.

From Capo Falcone the coast trends about 2 miles south-eastward to Puna Nera.

Isola Asinara.—Light.—This island is situated with Punta delle Salippi (Salite), its south-western extremity, about one mile north-north-eastward of Capo Falcone. This island consists of four hilly parts with low land between them. The principal hills in the four groups, from south to north, are Punta Maestra Fornelli, 876 feet (267^m0), Monte Tumbarino, 791 feet (241^m1), Punta Ruda, 702 feet (214^m0), and Monte Scomunica, 1,339 feet (408^m1) high. Monte Castellaccio, close southward of Punta Maestra Fornelli, is 702 feet (214^m0) high, and can be identified by an old fort on its summit. Monte Maestra Serre, about one mile south-eastward of Monte Scomunica, is 1,273 feet (388^m0) high. *See* views facing pages 220 and 221. The western coast of the island is rugged, rocky, and inaccessible.

Cala Scombro di Fuori (Francesce), Cala del Tappo, and Caccia Mala, the last two being separated by Capo Crabara (Molla), are three of the coves on the western side of Isola Asinara, but they afford little or no protection and are frequented only by fishermen.

Punta Caprara or dello Scorno, the northern extremity of the island, is fronted by shoals extending 1½ cables northward of it.

Charts 1780, 160, 2158a.

Chart 3916.

A light is exhibited, at an elevation of 262 feet (79^m9), from a white circular tower surmounting a square building, 116 feet (35^m4) in height, situated on Punta Caprara. *See view facing page 231.*

- 5 A signal station, open for public correspondence, is situated, at an elevation of 397 feet (121^m0), about 4½ cables southward of the light-house.

Torre Arena, on the northern entrance point of Cala Arena, about three-quarters of a mile south-eastward of Punta Caprara, is 82 feet 10 (25^m0) high.

Punta Tesoro and Punta Sabina lie, respectively, about one mile and 1½ miles south-eastward of Torre Arena; from the latter point foul ground extends about 1½ cables southward.

- Cala d'Olivia lies about midway between Punta Sabina and Punta Cannabillu, 1½ miles south-south-westward, and at its head is a small promontory with a tower on it, 66 feet (20^m1) high; on the northern side of the cove are some buildings.

- Rada della Reale.—Light.—Light-buoy.**—This anchorage is entered between Punta Trabucato, about 1½ miles southward of Punta Cannabillu, and Punta Giorri, about 4½ miles south-westward.

- Punta Trabucato is the extremity of a small peninsula, 89 feet (27^m1) high, with a low isthmus, and on its summit is a tower. A small rock, with a depth of less than 6 feet (1^m8), lies close off Punta Trabucato. On either side of the root of the isthmus are some build- 25 ings.

A reef of rocks, some of which are above water, lies on a spit which extends with depths of less than 6 fathoms (11^m0) south-eastward about 1½ miles south-eastward, from a position about 2 miles westward of Punta Trabucato (*Lat. 41° 03' N., Long. 8° 20' E.*).

- 30 A light is exhibited, at an elevation of 44 feet (13^m4), from a white cylindrical masonry tower on a masonry base, 43 feet (13^m1) in height, situated on the north-western part of the above-mentioned reef.

- A conical light-buoy, painted black and white in horizontal bands, and exhibiting a *red flashing light every four seconds*, marks the south- 35 eastern end of the reef.

On the northern shore of the roadstead are three groups of buildings belonging to the quarantine station.

Isola Scombro is situated close offshore about 3½ miles west-south-westward of Punta Trabucato.

- 40 **Anchorage.**—Excellent anchorage, in all weathers, can be obtained on either side of the reef in the northern part Rada della Reale, that westward of it being the better.

- Prohibited anchorage.**—Anchorage is prohibited in an area, the limits of which are indicated by pecked lines on the chart, situated 45 between the southern end of Isola Asinara and the mainland.

Chart 161b.

- Golfo dell' Asinara.—Coast.—Light.**—This bay is bounded on its north-western side by Isola Asinara, and is entered between Punta Caprara and Capo Testa, about 38 miles eastward. Its southern shore 50 is low and swampy in places, especially near the mouths of rivers, but elsewhere it is rocky and backed by mountains of considerable elevation.

There are no regular currents in the bay; but usually there is a slight easterly drift, though it is much influenced by the prevailing wind.

Chart 3916.

Torre delle Saline stands about $2\frac{1}{2}$ miles southward of Punta Nera and in the middle of the rocky coast between them is the fishing village of Stintino (Istintino). Tunny nets, *see* page 27, are laid out annually close northward of Torre delle Saline. 5

A light is occasionally exhibited, at an elevation of 33 feet (10^m1), from a concrete truncated pyramid on a hexagonal base, situated at Stintino.

Punta Budagni is about 6 miles south-eastward of Torre delle Saline, and between them the coast is low and sandy, and is backed by salt-10 water lagoons; in this stretch of coast are the mouths of Stagno di Pilo and Fiume Santo.

From Punta Budagni, the low sandy coast trends about 3 miles eastward to Porto Torres, close westward of which is the mouth of Rio Mannu, known locally as Rio Mascari or Turritano, and spanned by 15 a bridge with several arches.

Monte Alvaro (Alvaru) rises to an elevation of 1,125 feet (342^m9) about 5 miles south-westward of Porto Torres.

Chart 1128, plan of Port Torres.

Porto Torres.—Lights.—This town (Lat. $40^\circ 50' N.$, Long. $8^\circ 20' E.$) is the seaport of Sassari, a large town about 10 miles south-eastward, and from it cattle, oil, wine, cheese, cereals, vegetables, iron ore and silica are exported. The imports are bricks, iron, timber, cement, machinery and manufactured goods.

The port consists of an inner and an outer harbour protected by 25 breakwaters. The western breakwater extends about 4 cables northward and north-eastward from the eastern entrance point of Rio Mannu. The eastern breakwater extends about half a mile north-eastward and thence north-westward from the coast. The entrance, which faces northward, is about 700 feet (213^m4) wide. Two inner 30 moles, the western one Molo Teleferica extending north-north-eastward from the head of the harbour, and the eastern one Pontile del Faro extending north-westward from the root of the eastern breakwater, form the inner harbour, the entrance of which faces north-eastward and is about 300 feet (91^m4) wide. 35

A small, shallow, outer harbour is formed by the eastern side of the eastern breakwater and a spur projecting about three-quarters of a cable south-westward of it.

A light is exhibited, at an elevation of 66 feet (20^m1), from a white octagonal tower, 49 feet (14^m9) in height, near the port office at the 40 root of the eastern breakwater.

A light is exhibited, at an elevation of 28 feet (8^m5), from a red circular masonry turret, 25 feet (7^m6) in height, situated on the head of the eastern breakwater.

A light is exhibited, at an elevation of 28 feet (8^m5), from a black 45 circular masonry tower with a black lantern, 16 feet (4^m9) in height, situated on the head of the western breakwater.

A light is exhibited, at an elevation of 13 feet (4^m0), from a red circular masonry hut, 8 feet (2^m4) in height, situated on the head of 50 Pontile del Faro.

A light is exhibited, at an elevation of 13 feet (4^m0), from a black circular masonry hut, 8 feet (2^m4) in height, situated on the head of Molo Teleferica.

In 1951, the outer harbour was being dredged to a depth of 23 feet

Charts 161b, 160, 2158a.

Chart 1128, plan of Port Torres.

(7^m0), and the inner harbour to depths of from 10 to 11 feet (3^m0 to 3^m4). There are two mooring buoys in the inner harbour, and one in the outer harbour.

5 **Pilotage.**—Pilotage is compulsory and is carried out by local pilots, see page 20.

Anchorage.—Anchorage can be obtained off Porto Torres, in depths of 11 fathoms (20^m1), north-eastward of the head of the eastern break-water; but it is insecure, especially in winter, and with winds from
10 north-west to north-east vessels should seek shelter in one of the anchorages of Isola Asinara.

Port facilities.—Communications.—Stocks of coal, lubricating oil and petrol are maintained. Water is laid on to the south-western quay of the inner harbour, but it is of indifferent quality. Minor
15 repairs can be executed. There is a 1½-ton moving crane. There is a slipway capable of taking vessels up to 80 tons.

There is regular steamer communication with other Italian ports.
Chart 3916.

Coast.—About three-quarters of a mile eastward of Porto Torres
20 lies Punta San Gavino on which is the chapel of San Gavino a Mare, and from it a moderately high, steep coast trends about 2 miles south-eastward to Torre di Abbacorrente (*Lat. 40° 49' N., Long. 8° 27' E.*).

Punta Pedras de Fogu lies about 9 miles east-north-eastward of Torre di Abbacorrente, and between them the coast consists of sandy
25 dunes with bushes here and there.

A large yellowish factory, with a red roof, stands on an isolated barren hill about 3 miles south-eastward of Porto Torres.

The town of Sorso stands on the slopes of the hills about 2 miles inland of the middle of the above-mentioned dunes, and the cupola
30 and belfry of its church are noticeable.

From Punta Pedras de Fogu, the coast trends about 4 miles north-eastward to Castel Sardo, and is high, rocky, and intersected with valleys through which flow numerous streams.

On Punta Pedras de Fogu stands a prominent red building.

35 Castel Sardo stands on the seaward slope of a small promontory, 374 feet (114^m0) high, and in it is an ancient castle and the belfry of the cathedral, which latter, when seen from westward, has the appearance of a lighthouse, but from north-eastward does not show up against the hilly background. On either side of the promontory is a small
40 cove, but both are exposed and suited only to small craft; that on the western side is partly sheltered by an islet, and another islet lies close off the extremity of the promontory.

Dangers.—A detached shoal, with a depth of 29 feet (8^m8), lies
4 cables offshore, about three-quarters of a mile north-north-eastward
45 of Punta Pedras de Fogu.

Secca di Punta Spinosa, with a depth of 29 feet (8^m8), lies 4 cables offshore about one mile westward of Castel Sardo.

A shoal, with a depth of 16 feet (4^m9), lies about 6 cables westward of Castel Sardo, and 2 cables offshore; about 3 cables north-westward
50 of Castel Sardo is a small bank, with a depth of 42 feet (12^m8).

Secca di Frigiano, with a depth of 52 feet (15^m8), lies about one mile north-westward of Castel Sardo, and between it and Secca di Punta Spinosa is a bank with a depth of about 46 feet (14^m0).

Secca di Castel Sardo, with a depth of 36 feet (11^m0), rock, lies

Charts 161b, 160, 2158a.

Chart 3916.

about 5 miles northward of Castel Sardo. Northerly winds cause heavy overfalls, and the locality should then be avoided.

A detached shoal, with a depth of 26 feet (7^m9), lies within 4 cables of the coast about half a mile eastward of Castel Sardo. 5

Anchorage.—In fine weather, anchorage could be obtained 2½ cables north-eastward of Castel Sardo, in depths of 14 or 16 fathoms (25^m6 or 29^m3), but the bottom is rocky.

Chart 161b.

Coast.—From Castel Sardo, the coast trends about 9 miles north-eastward to abreast Isola Rossa, and is partly rocky but chiefly consists of sandy dunes about 50 feet (15^m2) high. Near the middle of this stretch of coast is the mouth of Fiume Coghinias, with the small village of San Pietro a Mare close south-westward of it; this river is the second largest in Sardinia, but its mouth cannot be identified from seaward except close-to; the low land on either side of the river is liable to flooding. The sandy coast may be approached to about half a mile, except near Isola Rossa, *see* below, and about 1½ miles westward of the mouth of the river, where a 5-fathom (9^m1) shoal lies about half a mile offshore. 20

Isola Rossa (*Lat.* 41° 01' N., *Long.* 8° 52' E.), 88 feet (26^m8) high, nearly bare, reddish in colour, and fringed with rocks, lies close off a point, 75 feet (22^m9) high and surmounted by a tower.

From abreast Isola Rossa the coast, which is rocky and fringed with numerous rocks, trends about 11 miles north-eastward to Punta Vignola. 25

Chart 1189.

Punta Vignola is rocky and 92 feet (28^m0) high, and about half a mile south-south-eastward of it is a prominent round tower, 62 feet (18^m9) in height, the summit of which is partially destroyed. 30

Capo Monte Rosso, 292 feet (89^m0) high, is a rugged, reddish, promontory, about 3 miles east-north-eastward of Punta Vignola, with an islet about 2 cables northward of it. The cape is easy to identify from westward, for it stands out from the surrounding low land, and has on it some large patches of white sand. Close off the north-western side are some above-water rocks, and about one-quarter of a mile from the north-eastern side of the cape is an above-water rock surrounded by sunken rocks. 35

From Capo di Monte Rosso, the coast trends about 5½ miles northward to the low, narrow, sandy isthmus connecting Capo Testa with the mainland, and is fringed with rocks and shoals extending 1½ cables offshore in places.

Chart 3915.

La Colba is the cove on the south-eastern side of Capo Testa.

Capo Testa.—**Dangers.**—**Light.**—This cape, on the southern side of the western end of Bonifacio strait, is the extremity of a rugged prominent peninsula, on the summit of which stands a small, square, inconspicuous pillar at an elevation of 416 feet (126^m8), *see* views facing pages 221 and 226. The peninsula is fringed with above-water rocks extending 2 cables offshore in places, but the outermost dangers, with depths, respectively, of 24 feet (7^m3), 24 feet (7^m3) and 21 feet (6^m4), lie about 1½ miles south-south-westward, 1½ miles west-south-westward, and one mile westward of Capo Testa lighthouse. 45

A light (*Lat.* 41° 15' N., *Long.* 9° 09' E.) is exhibited, at an elevation

Charts 1780, 676, 160, 2158a.

Chart 3915.

of 220 feet (67^m1), from a white square tower with two galleries, surmounting a white two-storied building, 77 feet (23^m5) in height, situated near the north-western end of the peninsula (*Lat.* 49° 15' N., 5 *Long.* 9° 09' E.). See view facing page 231.

BONIFACIO STRAIT.—General remarks.—Bonifacio strait (called by the Italians Bocche di Bonifacio), see views on chart 1189 and facing this page and page 227, is obstructed by numerous islands, rocks, and shoals, which are divided into two groups by Bocca Grande, 10 the southern group forming Arcipelago della Maddalena, see page 231.

Only a short description of the prominent landmarks and outermost dangers on the northern side of the approaches to the strait will be given in this volume; full details will be found in Mediterranean Pilot, Vol. II.

15 In gales, particularly from north-westward, the sea breaks everywhere in the passages.

Southern side of western approach.—Caution.—Dangers.—Light.—Buoyage.—Submarine cable.—From Capo Testa the high, rocky coast trends about 3½ miles eastward to Punta Falcone.

20 It is fringed by numerous rocks and shoals.

Cala Spinosa, on the northern side of the promontory of which Capo Testa is the western extremity, is sheltered from south-easterly and south-westerly winds. This cover affords anchorage to small craft with local knowledge. North-westerly winds cause a heavy sea.

25 There is a quay for boats.

Baia di Santa Reparata lies close eastward of the promontory of which Capo Testa is the western extremity, on the northern side of the isthmus.

Isolotto Municca (Monica) lies close inshore about one mile north- 30 eastward of the eastern entrance point of Baia di Santa Reparata, and from it rocks and foul ground extend about 2 cables north-westward and north-north-eastward.

A small detached shoal, with a depth of 11 feet (3^m4), lies about half a mile eastward of Isolotto Municca, and about 2½ cables northward of 35 the western entrance point of Porto Longonsardo with foul ground between it and the point; it is marked by a black conical buoy surmounted by a black cone, and is covered by the red sector of Porto Longonsardo light between the bearings 137° and 164°.

Porto Longonsardo is a narrow creek, the western entrance point of 40 which has on it a conspicuous circular tower, the top of which is elevated 134 feet (40^m8).

A submarine cable, the route of which is indicated by a wavy line on the chart, is landed about 1½ cables westward of the above-mentioned tower. See page 19.

45 Santa Teresa di Gallura (*Lat.* 41° 14' N., *Long.* 9° 12' E.) is a village on the western side of Porto Longonsardo. The large red buildings of the school and the square belfry of the church are prominent objects.

A light is exhibited, at an elevation of 36 feet (11^m0), from a white, square, masonry hut, 16 feet (4^m9) in height, situated on the eastern 50 side of Porto Longonsardo.

A small, detached shoal, with a depth of about 11 feet (3^m4), lies about 3 cables north-north-westward of the eastern entrance point, from which point foul ground extends about 1½ cables westward and

Charts 161b, 1131, 1780, 676, 160, 2158a.

a



Croix de la Trinité.

Port Bonifacio.

Cap Pertusato lighthouse, bearing 002°, 8 miles.

Signal station.

a

a

b



a Ile Canallo

Ile Lavezzi lighthouse.

Isola Razzoli lighthouse.

b

b



b

*Isola Spargi.
Isola Spargiollo.*

Punta Falcone.

Capo Testa lighthouse, bearing 127°, 6½ miles.

View, in three parts, of Bonifacio strait from westward.
(Original dated 1890.)



*Isola Tavolara
Capo Figari.
Monte Canu*

*Isola di
Capraia.*

Isola Dzia Maddalena

a

b



*Isola Barattini
and Isolotti Corelli.*

*Isola Razzoli
lighthouse.*

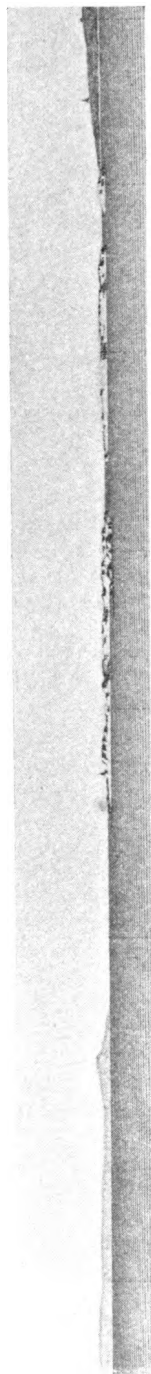
*Isola di Santa
Maria.*

a

b

b

c



*Ile Lavezzi lighthouse,
bearing 237°, 10 miles.*

Ile Cavallo.

*Cap' Pertusato
lighthouse.*

b

c

c



*Tour de Santa
Manza.*

View, in four parts, of Bonifacio strait from eastward.
(Original dated 1890.)

*Punta
Rondinara.*

c

Chart 3915.

northward. This shoal is marked by a red conical buoy inscribed *Longonsardo* in white, and surmounted by a red drum, and is covered by the red sector of Porto Longonsardo light between the bearings 189° and 210° . In 1945 it was reported that this buoy had been washed away.

Between Porto Longonsardo and Punta Falcone, about one mile north-eastward, the coast is foul, especially near a cove named Porto Quadro (*Lat. $41^\circ 15' N.$, Long. $9^\circ 13' E.$*).

Currents.—In the vicinity of Porto Longonsardo, when easterly winds blow during the summer, a west-going current has been observed, which may attain a rate of from $2\frac{1}{2}$ to 3 knots.

Chart 2157.

Coast.—Dangers.—Beacons.—Punta Falcone, *see* view facing page 226, is the northern extremity of Sardinia, and may be identified by a hill on it, 200 feet (61^m0) high and surmounted by a small pole with a topmark of planks. The point is fringed with rocks, and between it and Punta Marmorata, half a mile eastward, a reef extends about 2 cables offshore.

Punta Marmorata is surmounted by a white granite pyramid, 40 feet (12^m2) in height, and a similar beacon stands about 4 cables farther south-westward. Contra di li Scale rises to an elevation of 367 feet (111^m9) about 7 cables south-south-westward of Punta Marmorata.

Isole Marmorata, two islets close together, lie close south-eastward of Punta Marmorata. From the northern islet shoals extend about $2\frac{1}{2}$ and $1\frac{1}{2}$ cables, respectively, north-north-eastward and eastward. The passage between the islets and the mainland is obstructed by rocks.

Cala Marmorata, close southward of Isole Marmorata, has some rocks near the shore at its head, which should not be approached within one cable.

Cala Sambuco and Cala Barcaccia are two coves in the high rocky coast between the south-eastern entrance point of Cala Marmorata and Punta Monterosso, about $1\frac{1}{2}$ miles south-eastward; rocks and shoals extend about one cable from this coast in places.

Punta Monterosso is fringed by rocks and shoals, and should not be approached within three-quarters of a mile.

Scoglio Paganetto, the north-easternmost of the above-mentioned dangers, lies about half a mile north-eastward of the point.

In 1946, the light-structure on Scoglio Paganetto was destroyed.

Secca Colombo, a small rocky 23-foot (7^m0) patch, is the easternmost danger and lies about $4\frac{1}{2}$ cables south-eastward of Scoglio Paganetto.

Punta Sardegna, *see* page 233, in line with the south-western extremity of Isola Santo Stefano, *see* page 236, bearing about 124° , leads about $3\frac{1}{2}$ cables north-eastward of the above-mentioned dangers, but the latter point is not easily identified. *See* view facing page 230.

For a description of the coast farther south-eastward, *see* page 233. *Chart 3915.*

Anchorage.—Baia di Santa Reparata affords excellent shelter to small vessels with local knowledge, except during strong north-westerly or north-easterly winds, which send in a heavy swell.

Porto Longonsardo affords anchorage, sheltered from all winds except those from between north and north-east, to small vessels with local knowledge, in a depth of 26 fathoms (7^m9), south-westward of the lighthouse; farther in, the creek becomes very narrow and shallow.

Charts 161b, 1131, 1780, 676, 160, 2158a.

Chart 3915.

Strong north-westerly winds send in a heavy swell. A vessel approaching the entrance should keep in the *white* sector of Porto Longonsardo light, between the bearings 164° and 189°, which leads between the 5 off-lying shoals.

Chart 2157.

Cala Marmorata (*Lat. 41° 15' N., Long. 9° 14' E.*) affords good shelter from south-westerly and north-westerly winds, but those from the latter quarter sometimes send in a heavy swell.

10 Chart 429.

Northern side of western approach.—Dangers.—Lights.—

Signal station.—Pointe Aquila, about 33 miles north-eastward of Punta Caprara, *see* page 221 and chart 1780, is low and fringed with rocks. About three-quarters of a mile north-eastward of it is a hill, 15 423 feet (128^m9) high, covered with brushwood and surmounted by a tower.

Pointe Sénétosa light is exhibited, at an elevation of 230 feet (70^m1), from the northern of two white towers, 42 feet (12^m8) in height, situated one at either end of a white building about 4 cables north-eastward of 20 Pointe Aquila. A radiobeacon transmits from this lighthouse.

L'Homme de Cagna, 3,986 feet (1,214^m9) high, 6 miles inland and about 12½ miles eastward of Pointe Aquila, is a good landmark for vessels approaching from westward. It is the south-westernmost summit of Mont Cagna and is rocky and mushroom-shaped. Sommet 25 Balori, about one mile north-eastward, is conical and 4,252 feet (1,296^m0) high. Sommet d'Ovace, about half a mile further north-eastward, is conical and 4,393 feet (1,339^m0) high.

Haut-fond de Latoniccia, a rocky bank with a depth of 12 fathoms (21^m9), lies 2½ miles offshore, about 5½ miles south-south-eastward of 30 Pointe Aquila. During westerly winds, this bank should be avoided on account of the heavy sea over it, caused by eddies.

Les Moines, three groups of islets from 16 to 20 feet (4^m9 to 6^m1) high, and rocky reefs lie about 8 miles south-south-eastward of Pointe Aquila. These dangers are covered by the *red* sector of Pointe Sénétosa 35 light, between the bearings 306° and 328°. There are other dangers between them and the land.

A light is exhibited, at an elevation of 87 feet (26^m5), from a white tower situated on the south-westernmost shoal of Les Moines. Foul ground extends about 1½ cables south-westward of the light-tower.

40 Chart 3915.

Cap de Feno, about 17 miles south-eastward of Pointe Aquila, *see* chart 429, is rugged and bordered by foul ground. Two prominent rocks lie close westward of it, and there is a 26-foot (7^m9) rocky patch about 3½ cables south-westward of it.

45 A light is exhibited, at an elevation of 66 feet (20^m1), from a rectangular masonry tower, the lower part of which is white and the upper part black, 30 feet (9^m1) in height, situated on Cap de Feno.

Chart 1189.

Sommets de la Trinité, about 1½ miles north-eastward of Cap de 50 Feno, are three peaks, the westernmost and highest of which attains an elevation of 751 feet (228^m9); the easternmost, 719 feet (219^m1) high, is surmounted by Croix de la Trinité, and at its foot is a hermitage.

Port Bonifacio is entered about 2 miles east-south-eastward of Cap de Feno, and the coast in its vicinity consists of nearly horizontal

Charts 161b, 1131, 1780, 676, 160, 2158a.

Chart 1189.

plateaux of whitish limestone, backed by angular ridges. A life-boat is stationed at the port.

A light (*Lat.* 41° 23' N., *Long.* 9° 09' E.) is exhibited, at an elevation of 98 feet (29^m9), from a black square tower and dwelling, 36 feet (11^m0) in height, situated on Pointe de la Madonetta, the western entrance point of Port Bonifacio, *see* plan on chart 1126. 5

Cap Pertusato, about 2 miles south-eastward of Port Bonifacio, is situated in the middle of some high white limestone cliffs; close southward of it is an islet, 75 feet (22^m9) high, on which is a chapel. 10

A light is exhibited, at an elevation of 325 feet (99^m1), from a masonry tower, 52 feet (15^m8) in height, the lower part of which is white and the upper part black, situated on the summit of Cap Pertusato. There is a signal station on the cliffs, about half a mile north-westward of the lighthouse; reports can be transmitted through Lloyd's. *See* page 10. 15

Northern side of Bocca Grande.—Dangers.—Lights.—Île Lavezzi, about 3½ miles south-eastward of Cap Pertusato and 5 miles northward of Punta Marmorata, *see* page 227, is a rugged mass of granite; its south-western extremity is prolonged by two rocky islets, 20 on the southern one of which is a granite monument.

Pointe Becchi is the southern extremity of Île Lavezzi, and close eastward of it are two islets, with an 8-foot (2^m4) patch close north-eastward of them. Rocks with depths of 9, 24 and 23 feet (2^m7, 7^m3 and 7^m0) lie, respectively, about one cable southward, 2 cables southward, and 4½ cables west-south-westward of the point. 25

A light is exhibited, at an elevation of 90 feet (27^m4), from a square tower, 33 feet (10^m1) in height, painted red and white in horizontal bands, attached to a white house, with red horizontal bands on its eastern side, situated on Pointe Becchi. 30

Écueil de Lavezzi is an above-water rock about one mile southward of Pointe Becchi, with a 10-foot (3^m0) rocky patch on its northern side. A rocky patch, with a depth of 16 feet (4^m9), lies about 1½ cables north-westward of Écueil de Lavezzi. Several rocks, with depths of from 24 to 33 feet (7^m3 to 10^m1), lie within 4 cables north-eastward and eastward, and 6 cables south-south-eastward of Écueil de Lavezzi. Croix de le Trinité, bearing 319° and well open south-westward of Cap Pertusato, leads about three-quarters of a mile south-westward of these dangers. The *red* sector of Pointe Becchi light, between the bearings 334° and 053°, and that of Isola Razzoli, *see* page 231, between the bearings 093° and 106°, cover these dangers. 40

A light is exhibited, at an elevation of 54 feet (16^m5), from a tower, 32 feet (9^m8) in height, painted black and red in horizontal bands, situated on Écueil de Lavezzi; *see* sketch on chart 1189.

Northern side of eastern approach.—Dangers.—Light.—Île Cavallo, about one mile northward of Île Lavezzi, is hilly, and there is no safe passage between the two islands. The channel, about 1½ miles wide, between Île Cavallo and the mainland of Corsica, is much obstructed by islets and rocks. 45

Île Perduto, nearly 1½ miles eastward of Île Cavallo, is low, but on it stands a pyramidal beacon; there is an islet close southward of it, and both are surrounded by rocks and shoals extending as much as 3½ cables in places. There is a deep channel between Île Perduto and Île Cavallo. 50

Chart 1189.

Écueil de Perduto, about half a mile south-eastward of Île Perduto, is awash. The *green* section of Pointe Becchi light, between the bearings 125° and 237°, covers these dangers.

- 5 Tour de Santa Manza stands on a hill, 417 feet (127^m1) high, about 2½ miles northward of Île Cavallo. It is in ruins and is situated on the eastern side of a peninsula, in Corsica, of which the north-eastern extremity is Pointe Capicciolo.

Pointe Capicciolo (*Lat.* 41° 26' N., *Long.* 9° 16' E.) lies about three-
10 quarters of a mile north-eastward of Tour de Santa Manza, and is easily identified, for above it is a hill resembling a bishop's mitre.

Chart 1131.

Pointe de la Chiappa, *see* plan on chart 1126, is about 11 miles north-north-eastward of Pointe Capicciolo, and is the extremity of a stretch
15 of high and rugged coast.

A light is exhibited, at an elevation of 217 feet (66^m1), from a white square tower on a white base, 52 feet (15^m8) in height, attached to a white dwelling situated on Pointe de la Chiappa. A radiobeacon transmits from this lighthouse. There is a disused signal station about
20 1½ cables westward of the lighthouse.

Rochers du Toru, the westernmost of which resembles a finger, lie about 5½ miles southward of Pointe de la Chiappa. Danger du Toro, a detached 1½-fathom (2^m7) rock, marked on its eastern side by a black spindle buoy, surmounted by a cylinder, lies about half a mile eastward
25 of Rochers du Toru.

Danger de la Vacca, two rocks with depths of 2 and 2½ fathoms (3^m7 and 4^m6), lies 2½ miles offshore about 3½ miles south-south-eastward of Pointe de la Chiappa. It is marked by a black spindle buoy surmounted by a cylinder; in 1947 this buoy was reported to be miss-
30 ing. Between Danger de la Vacca and the coast is a group of islets and rocks, the outermost being Île de la Vacca.

Caution.—Caution must be exercised in the north-eastern approach to Bonifacio strait, for French men-of-war sometimes carry out firing practices, using Île de la Vacca as a target; the danger area is bounded,
35 southward, by the parallel of Pointe Capicciolo, westward by the land, eastward by the meridian of 9° 30' E., and northward by the parallel of Pointe Saint Cyprien, lat. 41° 37' N. Vessels must avoid the area while practices are in progress, and must strictly obey any directions given by patrol vessels.

40 Charts 2157 and 3915.

Bocca Grande.—Directions.—This, the main passage through Bonifacio strait, lies between Écueil de Lavezzi and Écueil de Perduto north-westward, and Punta Marmorata and Isola Razzoli, *see* page 231, south-eastward. It is not less than 3 miles wide, and its navigation
45 presents no difficulties.

At night, a vessel approaching from westward should steer for the light on Isola Razzoli (*Lat.* 41° 18' N., *Long.* 9° 20' E.), keeping southward of the *red* sector covering Écueil de Lavezzi. Having passed through the *red* sector of Pointe Becchi light covering Écueil de
50 Lavezzi, she should steer north-eastward out of the strait. A vessel approaching from northward or north-eastward, when eastward of Pointe Capicciolo, should approach with Isola Razzoli light bearing not less than 180°. When Île Lavezzi light bears 270°, she should steer to pass through the centre of the strait on a bearing of Capo

Charts 161b, 1780, 676, 160, 2158a.



Isola
Spargiolto.

Isola Spargi.

Punta Sardenia
in line with the
south-western extremity
of Isola San Stefano.

Soglio Paganello
light-structure,
bearing 145°, 1½ miles.

Monte
Canu.

Penisola,
delle Vacche.

Punta Sardegna from north-westward.



Isola Razzoli lighthouse,
bearing 085°, 3 miles.

Cala
Lunga.

Monte
Cattilo.

Cala Giorgio
Marino.

Isola Budelli.

Isola Razzoli from westward.



Punta Marginella,
bearing about 253°,
1½ miles.

Punta
Falcone.

Isolotti
Barrettinelli.

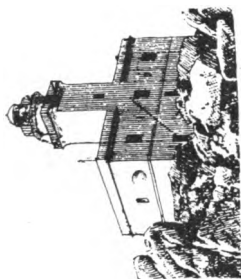
Isola Barrettini.

Isola Razzoli
lighthouse.

Passo di Barrettinelli from east-north-eastward.
(Originals dated 1892.)



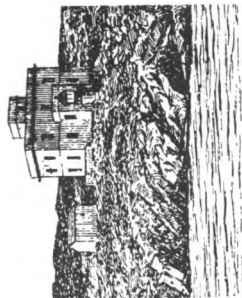
Punta Caprara
lighthouse.



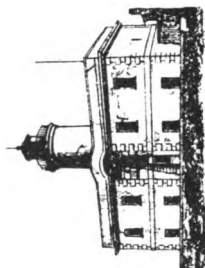
Capo Testa
lighthouse.



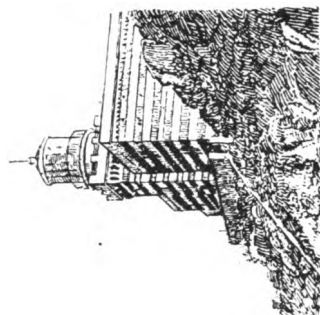
Isola Razzoli
lighthouse.



Punta Filetto
lighthouse.



Capo Ferro
main lighthouse.
(*Originals dated 1941.*)



Capo Bellavista
lighthouse.

Charts 2157 and 3915.

Testa light. When the vessel has passed through the *red* sector of Isola Razzoli light, she can steer with that light bearing about 080°, astern, until clear of Écueil de Lavezzi, when she can steer as convenient.

The passage between Écueil de Lavezzi and Île Lavezzi may be taken by vessels with local knowledge, but it is only 4 cables wide between the shoals on either side and is not recommended.

*Chart 2157.***ARCIPELAGO DI LA MADDALENA.—General remarks.—**

Caution.—This archipelago, in which there is an Italian naval base, consists of several red granite islands and numerous islets and rocks. The seven principal islands are Isole Maddalena, Caprera, Santo Stefano, Spargi, Budelli, Razzoli, and Santa Maria.

Charts 3915, 2157.

Isola Razzoli.—Dangers.—Light.—This island, the north-westernmost of the group, lies on the southern side of Bocca Grande with its north-western extremity about $3\frac{1}{2}$ miles east-south-eastward of Pointe Becchi, *see* chart 1189. It is hilly, fringed with rocks, and only accessible at the head of Cala Lunga, on its western side. Monte Capello, the highest hill, rises to an elevation of 213 feet (64^m9) in the south-eastern part of the island. *See* view facing page 230.

Secca Razzoli, with a depth of 26 feet (7^m9), rock, lies about $2\frac{1}{2}$ cables north-westward of Scoglio Callot, an above-water rock, situated $1\frac{1}{2}$ cables off the north-western extremity of the island.

A light (*Lat.* 41° 18' N., *Long.* 9° 20' E.) is exhibited, at an elevation of 282 feet (85^m9), from a square turret on a three-storied square building, 89 feet (27^m1) in height, painted black and white in horizontal bands, and inscribed *Faro Razzoli*, near the north-western extremity of Isola Razzoli. *See* view facing this page.

Isola Budelli.—Off-lying danger.—This island lies close southward of Isola Razzoli, from which it is separated by Cala Giorgio Marino; it is hilly and barren, and in its southern part Monte Budello rises to an elevation of 285 feet (86^m9).

Secca Budelli, with a depth of 23 feet (7^m0), lies about half a mile south-westward of Punta Cisterna, the western extremity of the island.

Anchorage.—Temporary anchorage could be obtained in the entrance of Cala Giorgio Marino, in depths of from 12 to 18 fathoms (21^m9 to 32^m9), but it is open westward.

Isola di Santa Maria.—Light.—This island lies north-eastward of Isola Budelli, from which it is separated by Passo Cecca di Morto, and eastward of Isola Razzoli, from which it is separated by Passo degli Asinelli. Isola di Santa Maria and Isola Budelli are connected, at the head of Cala Giorgio Marino, by Secca di Morto, a shoal flat on which lie several islets and rocks. Cala Santa Maria indents the south-eastern side of Isola di Santa Maria, but the depths in it are shoal, and in its entrance and off its south-western entrance point are rocks, the former awash and the latter above water. Monte Guardia del Turco, in the centre of the island, is 161 feet (49^m1) high.

A light is exhibited, at an elevation of 49 feet (14^m9), from a grey circular tower with a cupola, situated on Punta Filetto, the eastern extremity of Isola di Santa Maria; immediately behind the light-tower is a red, two-storied building, 41 feet (12^m5) in height, inscribed

Charts 161b, 1780, 676, 160, 2158a.

Charts 3915, 2157.

Punta Filetto. Distress signals, *see* page 13, are exhibited at this lighthouse. *See* view facing page 231.

Isolotto La Presa, 164 feet (50^m0) high, is an island almost connected with the northern extremity of Isola di Santa Maria ; several islets lie close off its north-western and western sides.

Cala Baticca lies between the southern side of Isolotto La Presa and the north-western side of Isola di Santa Maria ; a shoal bank, on which lie some rocks, extends from its head.

10 **Anchorage.**—Anchorage could be obtained in Cala Baticca, in depths of from 8 to 18 fathoms (14^m6 to 32^m9), but it is exposed north-westward, and strong north-easterly winds send in a heavy swell.

Islets and dangers eastward of Isola di Santa Maria.—**Light.**—

Eastward of Isola di Santa Maria are three groups of islets with deep but narrow channels between and round them.

Isolotti Corcelli are fringed with rocks and lie about 6 cables eastward of Punta Filetto ; the largest is 102 feet (31^m1) high.

A light is exhibited, at an elevation of 59 feet (18^m0), from a conical tower, painted red and white in horizontal bands, 26 feet (7^m9) in height, situated on the summit of the northernmost of Isolotti Corcelli (Lat. 41° 18' N., Long. 9° 24' E.).

Passo di Santa Maria separates Isolotti Corcelli from Isola di Santa Maria, and in the middle of it is a rocky shoal, with a depth of 21 feet (6^m4).

25 Isola Barretтини, 131 feet (39^m9) high and surrounded by rocks, lies about 3½ cables southward of the largest of Isolotti Corcelli.

Isolotti Barrettinelli lie about one-quarter of a mile southward of Isola Barretтини, and from them shoal banks extend about 1½ cables and one cable north-north-westward and southward, respectively.

30 Passo di Barrettinelli, between Isolotti Barrettinelli and Punta Marginetto, the northern extremity of Isola della Maddalena, *see* page 234, is half a mile wide between the shoals on either side. *See* view facing page 230.

Punta Filetto light is obscured over all the above islets, between the bearings 252° and 333°.

Isola Spargi.—This island is situated with Punta Zanotto, its north-western extremity, about 1½ miles southward of Punta Cisterna. It is hilly, rugged, and fringed with rocks, especially on its western side, and its summit, Monte di Guardia Preposti, attains an elevation of 40 509 feet (155^m1). Punta Bonifazzina lies about 6½ cables eastward of Punta Zanotto, and about 4 cables south-eastward of it is Cala Canniccia, available only to boats. Cala Alga (Arga) and Cala Corsara are situated in the southern end of the island, and are only available to small craft with local knowledge. A prominent white beacon 45 stands on the eastern shore of Cala Corsara. In Cala Ferrigno, on the north-eastern side of the island, a jetty extends about half a cable, with depths of 10 or 11 feet (3^m0 or 3^m4) at its head.

Off-lying islet and dangers.—**Light-buoy.**—Detached rocks, with depths of 29 and 33 feet (8^m8 and 10^m1), lie about half a mile east-north-eastward and east-south-eastward, respectively, of Punta 50 Bonifazzina.

A detached shoal, with a depth of 23 feet (7^m0), rock, lies about half a mile north-north-westward of Punta Zanotto.

Isola Spargiotto, about 3½ cables off the north-western side of Isola

Charts 1189, 161b, 1131, 1780, 676, 160, 2158a.

Charts 3915, 2157.

Spargi, is 157 feet (47^m8) high and bare; the channel between should not be attempted. A rock, with a depth of 10 feet (3^m0), lies about 1½ cables south-westward of the south-western extremity of Isola Spargiotto.

Isolotto Spargiotello lies close off the north-western side of Isola Spargiotto, with a 10-foot (3^m0) rocky patch about one cable west-south-westward of it.

A detached 18-foot (5^m5) patch lies, 1½ cables from the western side of Isola Spargi, about 8 cables south-south-eastward of Isola Spargiotto.

Secca Corsara, with a depth of 10 feet (3^m0), rock, lies about 2½ cables south-westward of the south-western extremity of Isola Spargi. Its south-south-western side is marked by a can light-buoy, painted red, surmounted by a globe above a triangle point down and exhibiting a red flashing light every five seconds. Punta Sardegna, see below, in line with the south-western extremity of Isola Santo Stefano, see page 236, bearing about 124° leads about one cable south-westward of this danger, but see page 227.

Caution.—A white house on the shore of Cala Canniccia, when seen from Passo di Santa Maria, may be mistaken, if the visibility is poor, for Punta Sardegna lighthouse (page 233).

Channel south-westward of Isola Spargi.—**Light.**—This channel is the main approach from north-westward to Rada di la Maddalena.

From Punta Monterosso, see page 227, the northern coast of Sardinia, forming the south-western shore of the channel, trends about 1½ miles south-south-eastward to the entrance of Porto Pozzo, and is steep and fringed with rocks extending as much as 2 cables offshore in places.

Punta delle Vacche, the northern extremity of Penisola delle Vacche, is the eastern entrance point of Porto Pozzo, and from it a shoal bank extends about one-quarter of a mile northward.

Chart 2157.

Penisola delle Vacche is 308 feet (93^m9) high, and its eastern side is foul for about 2 cables offshore in places.

Secca di Macchiamala, close off the north-eastern side of Penisola delle Vacche and about 8 cables south-south-eastward of Punta delle Vacche, is marked by a red iron staff surmounted by a white iron flag.

Porto Liscia is entered between Penisola delle Vacche and Penisola Cavalli, about three-quarters of a mile eastward. A detached 5-fathom (9^m1) shoal lies in the middle of the harbour, and a shoal bank extends 2 cables from the southern shore in places.

Penisola Cavalli is 52 feet (15^m8) high, and within 1½ cables northward of its extremity is an islet with above-water rocks close eastward of it and a shoal, with a depth of 3 feet (0^m9), close off its western side.

Porto Pollo is entered between Penisola Cavalli and Punta Diego, about three-quarters of a mile eastward. A shoal bank extends about one cable west-north-westward of Punta Diego.

Cala di Trana is a cove, about three-quarters of a mile eastward of Punta Diego, that is available to small craft with local knowledge.

Punta Sardegna, close eastward of Cala di Trana, is high, rocky, and free from off-lying dangers. About 4 miles southward of it Monte Canu (*Lat. 41° 08' N., Long. 9° 21' E.*), see chart 161b and view facing page 230, rises to an elevation of 1,299 feet (395^m9).

A light is exhibited, at an elevation of 115 feet (35^m0), from a grey

Charts 1189, 161b, 1131, 1780, 676, 160, 2158a.

Chart 2157.

métal turret on a white two-storied building, 43 feet (13^m1) in height, situated on Punta Sardegna.

For continuation south-eastward, *see* page 235.

- 5 **Anchorage.**—Porto Pozzo affords sheltered anchorage to small vessels with local knowledge.

Porto Liscia is open northward, but affords some shelter, in depths of about 9 fathoms (18^m3), in its western part.

- 10 Anchorage can be obtained in Porto Pollo, in depths of 4½ fathoms (8^m2), weed, about 6½ cables south-westward of Punta Diego. Small vessels, with local knowledge, can obtain excellent shelter at the head of the harbour, southward of an islet, but there are shoal banks on either side of its approach.

- Isola della Maddalena.**—This island, the most important and only 15 thickly populated one in the archipelago, is almost everywhere stony and uncultivated. It is hilly, the principal summits being Monti Puntiglioni, 535 feet (163^m1), Guardia Vecchia, 499 feet (152^m1), and Punta dei Colmi, 400 feet (121^m9) high, in the south-western part of the island, and Monte Guardia del Turco, 276 feet (84^m1) high, near 20 its northern end; its coasts are indented and in most places rocky, but there are some coves with sandy beaches at their heads.

A white obelisk stands on the summit of Monte Guardia del Turco.

- Signal station.**—**Storm signals.**—A signal station, consisting of a yellowish hexagonal tower, with large windows, surmounted by a 25 flagstaff, stands in Forte Santó Vittorio on Guardi Vecchia. This station is open for public correspondence. There is a radio station here; *see* page 27. Storm signals are displayed; *see* page 12.

- Western coast.**—**Dangers.**—Punta Marginetto (*Lat.* 41° 16' N., *Long.* 9° 25' E.), *see* page 232, is low, and is fringed with dangerous 30 rocks and shoals extending about 1½ cables offshore.

Cala Stagno Torto is entered between Punta Marginetto and Punta Abbatoggia, about three-quarters of a mile west-south-westward. Its shores are fringed with rocks and it is exposed to north-easterly winds. This cove should not be entered without local knowledge.

- 35 Punta Abbatoggia is fringed with rocks, and from it a shoal bank, with an islet on it, extends about 1½ cables northward.

- Punta Testiccioli lies about 1½ miles south-westward of Punta Abbatoggia, and between them the coast is fringed with islets, rocks, and shoals extending a quarter of a mile offshore in places; a white pyramidal column stands on each of these points. Isolotto Abbatoggia, the 40 largest of the islets, lies on the coastal bank about half a mile southward of Punta Abbatoggia. Cala D'Inferno, on the north-eastern side of Punta Testiccioli, affords no shelter.

- Punta Nido d'Aquila lies about one mile southward of Punta Testiccioli, and about midway between them is Cala Francese, which is 45 exposed to south-westerly and westerly winds, but affords shelter to small craft with local knowledge; there is a small quay on the southern shore of this cove.

- Eastern coast.**—**Dangers.**—From Punta Marginetto, the eastern 50 coast of Isola della Maddalena, trends about 2 miles south-south-eastward to Punta Rossa, and in it are Porto Lungo and Cala Spalmatore, the entrance points of which are foul.

Isolotto Giardinelli, the northern extremity of which lies about 3 cables south-eastward of Punta Rossa, is 59 feet (78^m0) high. Its

Charts 1189, 161b, 1131, 1780, 676, 2158a.

Chart 2157.

coasts are fringed with rocks and shoals extending 2 cables offshore in places, and its south-western extremity is almost connected with Isola della Maddalena.

La Peticchia is a narrow inlet, between Isolotto Giardinelli and the coast westward of it. It is open north-eastward, but affords good shelter to small craft with local knowledge, though its entrance is obstructed by rocks and shoals and its inner part is shoal.

Anchorages.—Small vessels, with local knowledge, could obtain anchorage in Porto Lungo or Cala Spalmatore. *Charts 564 and 2157.*

Passo della Moneta.—**Dangers.**—**Buoyage.**—This channel separates Isola della Maddalena from Isola di Caprera, *see* page 241. Its southern end is shoal and is obstructed by a breakwater, between the islands, in which is a narrow gap spanned by a swing bridge. In 1947, the swing bridge was in a damaged condition and blocked; the clearance beneath was $15\frac{1}{2}$ feet (4^m7). The fairway, on either side of which are rocks and shoals, and the western side of which is marked by a buoy and two beacons, has a least depth in it of about 5 feet (1^m5), and is only available to small vessels with local knowledge.

Punta Galera, on the southern side of which is Cala Napoletana, is the north-western extremity of Isola di Caprera, and lies about one mile eastward of Punta Rossa. A rocky shoal, with a depth of less than 6 feet (1^m8), lies within 4 cables north-north-eastward of the point, and a large above-water rock lies between it and the coast. Porto Garibaldi, on the western side of Isola di Caprera, is situated about one mile southward of Punta Galera.

Anchorage.—Porto Garibaldi affords anchorage, somewhat sheltered by the islets in its approach, to small vessels with local knowledge, in depths of about $3\frac{1}{2}$ fathoms (6^m9). *Chart 2157.*

Western approach to La Maddalena.—**Dangers.**—**Lights.**—**Buoyage.**—From Punta Sardegna, *see* page 233, the northern coast of Sardinia trends about $1\frac{1}{2}$ miles southward to the head of Rada di Mezzo Schifo, and is bold.

Rada di Mezzo Schifo is entered between Punta Stropello, about half a mile southward of Punta Sardegna, and Punta Palau, about one mile further south-eastward; its shores are sandy, and at its head is the mouth of Fiume Sorao.

A light is exhibited, at an elevation of 33 feet (10^m1), from a hexagonal concrete hut, 20 feet (6^m1) in height, situated on Punta Palau (*Lat. $41^{\circ} 11' N.$, Long. $9^{\circ} 23' E.$*).

Punta Tegge, the south-western extremity of Isola della Maddalena, lies about 3 cables south-south-eastward of Punta Nido d'Aquila, *see* page 234. It is a small rocky peninsula, 66 feet (20^m1) high, with numerous shoals southward of it and of the coast eastward of it.

A masonry beacon, 10 feet (3^m0) high, in the form of a truncated pyramid, painted red and white in horizontal bands, marks a detached shoal about one cable westward of Punta Tegge.

A white quadrangular pyramidal beacon, 53 feet (16^m2) high, marks Scoglio Bianco, the outermost danger, about 2 cables south-south-eastward of Punta Tegge.

A white conical buoy, surmounted by a globe, marks Secca di Forte Tegge, about $1\frac{1}{2}$ cables south-eastward of Scoglio Bianco beacon.

Charts 1189, 161b, 1131, 1780, 676, 2158a.

Chart 2157.

Secca di Mezzo Passo is a rocky shoal, on which are three heads awash, about $2\frac{1}{2}$ cables south-westward of Scoglio Bianco.

A light is exhibited, at an elevation of 25 feet (7^m6), from a red masonry pyramid, situated on Secca di Mezzo Passo.

Secca del Palau is a rocky shoal, on which are three large above-water rocks, about half a mile north-north-eastward of Punta Palau.

Lights, disposed vertically, are exhibited at elevations, respectively, of 19 and 21 feet (5^m8 and 6^m4), from an iron post surmounted by a beacon, in the shape of a truncated pyramid, 16 feet (4^m9) in height, situated near the southern extremity of Secca del Palau. There is a white pyramidal masonry beacon, 16 feet (4^m9) high, near the western edge of the shoal. The north-eastern extremity of the shoal is marked by a conical buoy, painted red and white in horizontal bands and surmounted by a globe. For leading lights and marks for the channels on either side of Secca del Palau, *see* page 237.

For continuation south-eastward, *see* page 238.

Anchorage.—Rada di Mezzo Schifo affords anchorage in a depth of 11 fathoms (20^m1), sand, about $2\frac{1}{2}$ cables offshore, with the main lighthouse on Capo Ferro, *see* page 242, in line with the southern extremity of Isola Santo Stefano, bearing 110° , or about 4 cables westward of Punta Palau lighthouse, in depths of from 7 to 9 fathoms (12^m8 or 16^m5). Though the roadstead is open northward, winds from that direction do not send in much swell, and the holding ground is good.

Charts 564 and 2157.

Isola Santo Stefano.—**Dangers.**—**Buoyage.**—This island is rather flat on its western side, but rises eastward to an elevation of about 330 feet (100^m6) and thence falls precipitously to the sea. It is fringed with rocks, especially on its northern and western sides, and attains at Punta dello Zuccherò, near its centre, an elevation of 331 feet (100^m9). It separates Rade di la Maddalena, north-westward, from Rada di Santo Stefano, eastward.

Casa Napoleone (Casa la Torre), a square, stone, two-storied building, stands about $2\frac{3}{4}$ cables eastward of the south-western extremity of Isola Santo Stefano; its top is elevated 72 feet (21^m9). Forte San Giorgio, the top of which is elevated 141 feet (43^m0), stands on the south-western part of the island. Both Casa Napoleone and Forte San Giorgio are prominent landmarks (*Lat. $41^\circ 12' N.$, Long. $9^\circ 24' E.$*).

Isolotto La Paura, 43 feet (13^m1) high, arid, rocky and yellowish in colour, lies close off the middle of the western side of Isola Santo Stefano, and close west-north-westward of its north-western extremity is a shoal marked by a white pyramid. The channel between this shoal and Secca del Palau is about $1\frac{1}{2}$ cables wide. For leading lights, *see* page 237.

Secca Paura, about $2\frac{1}{4}$ cables north-eastward of the north-western extremity of Isolotto La Paura, has a depth of 2 feet (0^m6), and is marked on its western side by a white conical buoy, surmounted by a globe.

Secca Chiesa, three-quarters of a cable offshore and about $1\frac{3}{4}$ cables south-westward of the north-western extremity of Isola Santo Stefano, has a depth of 4 feet (1^m2), and is marked on its western side by a conical buoy, surmounted by a globe and painted black and white in horizontal bands.

Charts 1189, 161b, 1780, 676, 2158a.

Charts 564 and 2157.

For a description of the southern and eastern coasts, respectively, of Isola Santo Stefano, *see* pages 238 and 239.

Rada di la Maddalena.—Lights.—Buoyage.—The northern shore of the roadstead, between Punta Tegge, *see* page 235, and Punta Nera, about 8 cables eastward, is fringed with shoals; those northward and north-westward of Secca di Forte Tegge are described on page 235.

Secca Padula, about $2\frac{1}{2}$ cables west-south-westward of Punta Nera, is marked by two white masonry beacons.

A white pyramidal beacon, 10 feet (3^m0) high, marks the eastern side of a shoal about $1\frac{1}{2}$ cables south-westward of Punta Nera; the southern extremity of this shoal is marked by a red conical buoy surmounted by a cylinder.

Chart 564.

A white beacon, 16 feet (4^m9) high, stands on the southernmost of 15 some rocks extending from the shore about one cable eastward of Punta Nera (*Lat.* $41^\circ 13' N.$, *Long.* $9^\circ 24' E.$).

Cala Gavetta, with depths of from 6 to 21 feet (1^m8 to 6^m4), is entered about 3 cables eastward of Punta Nera; on its western entrance point stands the office of the Captain of the Port, and on its eastern entrance point is a monumental column.

A light is exhibited, at an elevation of 16 feet (4^m9), from a mast, 13 feet (4^m0) in height, situated near the office of the Captain of the Port.

Cala Mangiavolpe, which is bordered by wharves, and near the head of which stands the Governor's Palace, is entered about a quarter of a mile eastward of Cala Gavetta.

Two lights, disposed vertically, are exhibited, at elevations of 26 and 33 feet (7^m9 and 10^m1), from a concrete column painted black and white in horizontal bands and 31 feet (9^m4) in height, situated on the eastern corner of a wharf on the western side of the entrance to Cala Mangiavolpe and about 2 cables east-north-eastward of the office of the Captain of the Port (*Lat.* $41^\circ 13' N.$, *Long.* $9^\circ 24' E.$).

A light is exhibited, at an elevation of 75 feet (22^m9), from a square turret on the Governor's Palace, 69 feet (21^m0) in height, situated at the head of Cala Mangiavolpe.

The light on the Governor's Palace in line with the two lights situated on the western side of the entrance to Cala Mangiavolpe, bearing 037° , leads through the channel between Secca del Palau and Isolotto La Paura.

A light is exhibited, at an elevation of 33 feet (10^m1), from a concrete post, 30 feet (9^m1) in height, situated on the south-eastern corner of a wharf about one cable south-westward of the Governor's Palace.

Two lights, disposed vertically, are exhibited, at an elevation of 18 feet (5^m5), from a wooden post, 15 feet (4^m6) in height, situated on the head of Punta Nera, a rubble mole extending southward from the eastern entrance point of Cala Mangiavolpe.

Cala Chiesa is entered between Punta Nera and Isola Chiesa, about $1\frac{1}{2}$ cables eastward. There are depths of from 6 to 36 feet (1^m8 to 11^m0) in this cove. The south-eastern side of the entrance channel is marked by four buoys.

Anchorage.—Anchorage in Rada di la Maddalena is reserved for merchant vessels and small Italian men-of-war. It is exposed to

Charts 1189, 161b, 1780, 676, 2158a.

Chart 564.

westerly winds, which are sometimes strong. There are several mooring buoys for small vessels.

La Maddalena.—Port facilities.—This town (*Lat.* 41° 13' N., *Long.* 9° 24' E.) derives its importance from the naval base at the head of Rada di Santo Stefano (page 239). The most prominent building in the town is the college, a large, whitish, three-storied edifice standing on a hill about 3 cables northward of the office of the Captain of the Port.

10 There is a small floating dock belonging to the Italian navy; for details, *see* page 486.

Small supplies of provisions are obtainable. Water is supplied by the naval authorities.

There is a signal station in Forto Santo Vittorio, on Monte Guardia Vecchia; *see* page 234. For radio communication, *see* page 21.

Passage northward of Isola Sante Stefano.—Dangers.—Light.—Buoy.—This passage is obstructed by a shoal bank, with depths of less than 18 feet (5^m5), on which lies Isola Chiesa. A depth of 13 feet (4^m0) can be carried in the fairway across this bank.

20 An area, the limits of which are indicated by pecked lines on the chart, and which had been dredged, in 1939, to a depth of 14 feet (4^m3), lies in this passage.

Scoglio Nasse is the northernmost of a group of rocks within one cable north-north-eastward of the north-western extremity of Isola Santo Stefano. This rock is painted white and is marked by a white staff with a black flag.

A beacon, consisting of a staff surmounted by a sphere and a hemisphere, marks the edge of the shoal water about half a cable east-north-eastward of Scoglio Nasse.

30 A white conical daymark, surmounted by a globe, is situated on the southern side of the fairway, about three-quarters of a cable north-eastward of Scoglio Nasse.

A light is exhibited, at an elevation of 7 feet (2^m1), from a red masonry beacon, in the form of a truncated pyramid, situated on a shoal on the southern side of the fairway, about 1½ cables eastward of Scoglio Nasse beacon.

Isola Chiesa is rocky, and from its south-eastern extremity a mole extends about 1½ cables southward and south-westward.

A light is exhibited, at an elevation of 59 feet (18^m0), from a wooden mast, on a masonry column, 16 feet (4^m9) in height and painted black and white in horizontal bands, situated on the summit of Isola Chiesa. This light in line with that in Forte Camicio, *see* page 240, bearing about 064°, leads into Rade di la Maddalena between Secca di Mezzo Passo and Secca del Palau, *see* page 236. On a wall below this light-mast is a stripe for use as a leading mark by day.

Lights are exhibited from the two radio masts on Isola Chiesa.

Two lights, disposed vertically, are exhibited at an elevation of about 33 feet (10^m1), from a concrete column, 28 feet, (8^m5) in height, situated on the head of the mole extending southward from Isola Chiesa.

A white conical buoy is moored on the northern side of the fairway within three-quarters of a cable westward of the head of the mole. *Chart 2157.*

Channel southward of Isola Santo Stefano.—Light.—Cala di

Charts 1189, 161b, 1780, 676, 2158a.

Chart 2157.

Villamarina, in the southern side of Isola Santo Stefano, is a narrow inlet that affords shelter to small craft, with local knowledge, but its shores are fringed with rocks and shoals, and others lie on either side of its approach. On the western side of the cove are Forte di San Giorgio, and Casa Napoleone, described on page 236. 5

A small detached shoal, with a depth of $1\frac{1}{2}$ fathoms (2^m3), lies one cable offshore about midway between the eastern entrance point of Cala Villamarina and Punta Santo Stefano, the south-eastern extremity of Isola Santo Stefano. 10

From Punta Palau, *see* page 235, the southern shore of the channel trends about 2 miles east-south-eastward to Capo d'Orso.

Palau (*Lat.* $41^\circ 11' N.$, *Long.* $9^\circ 23' E.$) is a village on the western side of a cove about 4 cables south-south-eastward of Punta Palau. A pier extends about a quarter of a cable from abreast the village. There are 15 depths of from 13 to 16 feet (4^m0 to 4^m9) alongside. A 3-ton crane stands on the head of this pier. A light is exhibited, at an elevation of 15 feet (4^m6), from an iron framework crane, 13 feet (4^m0) in height, situated at the head of the pier. A rocky shoal, with a depth of about 11 feet (3^m4), marked by a conical buoy painted red and white 20 in horizontal bands, lies about a quarter of a cable eastward of the pierhead.

From Punta Nera, the eastern entrance point of the above-mentioned cove, a shoal bank, on which lies a rock with a depth of less than 6 feet (1^m8), marked by a small conical buoy, extends about 25 2 cables north-westward.

Secca Due Piagge, with a depth of one foot (0^m3), lies off the eastern side of the cove, and is marked on its western side by an iron staff surmounted by a white cylinder. A red conical buoy marks a 4-foot (1^m2) shoal about one cable northward of this beacon, and a conical 30 buoy, painted red and white in horizontal bands, marks a rock about half a cable eastward of the beacon.

Eastward of Punta Nera, the steep coast is fringed with islets, rocks, and shoals extending as much as $1\frac{1}{2}$ cables offshore in places.

Capo d'Orso is a point that rises rapidly to a barren rocky hill, 35 427 feet (130^m1) high, on the summit of which is a peculiar rocky formation which resembles a recumbent bear.

A light is exhibited, at an elevation of 36 feet (11^m0), from a framework structure on a white square base, 21 feet (6^m4) in height, situated on Capo d'Orso. 40

For continuation eastward, *see* page 243.

Charts 564 and 2157.

Rada di Santo Stefano.—Dangers.—Lights.—Buoyage.—This naval harbour lies between the eastern side of Isola Santo Stefano and the southern part of the western side of Isola di Caprera, and is entered 45 between Punta Santo Stefano and Punta Fico, the south-western extremity of Isola di Caprera, about one mile south-eastward.

The eastern coast of Isola Santo Stefano is comparatively steep-to, with the exception of a spit, with depths of less than 18 feet (5^m5), which extends about one cable from the shore, about 2 cables southward 50 of Punta Sassu, the north-eastern extremity of the island.

There are two piers between Punta Sassu and the shoal spit remarked on above. They are situated below some large oil tanks, and the southern and longer one has berths alongside available to vessels draw-

Charts 1189, 161b, 1780, 676, 2158a.

Charts 564 and 2157.

ing up to 20 feet (6^m1), but caution must be exercised when approaching or leaving it on account of the shoal spit close southward of it. A light (*Lat.* 41° 12' N., *Long.* 9° 25' E.) is occasionally exhibited, at an elevation of 5 feet (1^m5), from this pier.

Punta Fico is the western extremity of a small peninsula, fringed with shoals, which rises to Monte Fico, 233 feet (71^m0) high.

A conical buoy, surmounted by a cone, painted black and white in horizontal bands, is moored off the edge of the shoal bank extending south-westward of Fico, which islet lies close off the south-western extremity of the peninsula.

Punta Coda, the south-western entrance point of Cala Bacca, lies about half a mile northward of Punta Fico.

Punta Stagnali lies about three-quarters of a mile north-north-eastward of Punta Coda and there are many shoals within 3½ cables south-westward, 3 cables westward, and 3½ cables north-westward of it.

Chart 564.

Cala Stagnali, on the eastern side of Punta Stagnali, is shoal, and at its head are some buildings, belonging to the naval base, with a landing mole. The southern side of the entrance channel is marked by two beacons, painted black and white in chequers; and a conical buoy, surmounted by a globe, moored about 1½ cables northward of Punta Stagnali.

Between Punta Stagnali and Punta Moneta, the south-eastern extremity of Isola della Maddalena, the eastern shore of the harbour is fronted by extensive shoals.

Cala Camicia and Cala Camiciotto are two coves on the northern side of the harbour, westward of Punta Moneta; in both coves and along the greater part of the remainder of the head of the harbour are wharves belonging to the naval base; but, with the exception of that on the western side of the entrance of Cala Camicia, they are only available to vessels of light draught.

A light is exhibited, at an elevation of 23 feet (7^m0), from a wooden post, 18 feet (5^m5) in height, situated on the head of the mole on the western side of the entrance to Cala Camiciotto.

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron framework structure, 16 feet (4^m9) in height, situated on the head of a small pier on the eastern side of Cala Camicia.

A light is exhibited, at an elevation of 20 feet (6^m1), from an iron framework structure, 11 feet (3^m4) in height, situated on the head of the wharf on the western side of the entrance to Cala Camicia.

Shoals with depths, respectively, of 18 and 30 fathoms (5^m5 and 9^m1), lie about one and 1½ cables southward of the head of the above-mentioned wharf.

A red conical buoy marks the eastern side of a 16-foot (4^m9) patch about one cable south-eastward of the head of the wharf on the western side of the entrance to Cala Camicia.

A conical buoy marks a shoal spit extending about 2 cables southward from the eastern entrance point of Cala Camiciotto; there is a detached 17-foot (5^m2) patch about 1½ cables southward of the buoy. A conical buoy is moored three-quarters of a cable south-westward of the western entrance point of this cove.

A light is exhibited, at an elevation of 23 feet (7^m0), from a post, 20 feet (6^m1) in height, situated on the head of the Naval Hospital.

Charts 1189, 161b, 1780, 676, 2158a.

Chart 564.

landing place close westward of Cala Camiciotto. A buoy marks the south-western side of a 6-foot (1^m8) patch about half a cable south-south-westward of the landing place.

A light is exhibited, at an elevation of 123 feet (37^m5), from a flag-staff, 26 feet (7^m9) in height, situated in Forte Camicio, close northward of the Naval Hospital. On the wall of the fort, below the flagstaff, is a stripe for use as a leading mark, *see* page 238, by day. 5

A spit, with depths of less than 18 feet (5^m5), extends about 2½ cables south-eastward from the eastern side of Isola Chiesa. Its north-eastern side is marked by a red conical buoy surmounted by a globe. 10

The south-eastern approach to the boat passage north-eastward of Isolotto Chiesa is marked by conical buoys.

For the approach to Rada di Santo Stefano from eastward, *see* page 243. 15

Anchorage.—Anchorage can be obtained by large vessels in depths of from 18 to 23 fathoms (32^m9 to 42^m1), sand and weed, but the holding ground is not good, and strong westerly winds sometimes cause vessels to drag. The anchorage is secure during north-easterly and south-easterly winds. There are a number of mooring-buoys in Rada di Santo Stefano. 20

Chart 2157.

Isola di Caprera.—**Dangers.**—**Prohibited anchorage.**—This island, the easternmost in the archipelago, attains an elevation of 696 feet (212^m1) at Punta Teialone (Tejalone), near the middle of its eastern side. 25

The coast between Punta Galera, *see* page 235, and the northern extremity of the island, about 6 cables eastward, is foul, but from the latter point as far as Punta Coticcio, about 1½ miles south-south-eastward, it is free from off-lying dangers. 30

Punta Coticcio, of a reddish colour, is the eastern extremity of a small promontory, on the southern side of which is Cala Coticcio.

Cala Brigantina (*Lat.* 41° 12' N., *Long.* 9° 29' E.) is entered about one mile southward of Punta Coticcio. Boats can land on a beach at the head of this cove. 35

Cala Portese, about one mile southward of Cala Brigantina, is exposed to north-easterly, and south-easterly winds send in a heavy surf. Boats can land on a beach at its head. At its head, which is shoal, is a narrow and partly sandy isthmus, which connects the promontory of Punta Rossa, 131 feet (40^m9) high, with Isola Caprera. A submarine telegraph cable, *see* page 19, is landed in this cove, and anchorage is prohibited. 40

Isolotto Pecora, 49 feet (14^m9) high, is fringed by a shoal bank which connects it with the eastern end of the promontory of Punta Rossa.

For a description of the southern and western coasts of Isola di Caprera, *see* pages 243 and 239, respectively. 45

Anchorage.—Small vessels can obtain sheltered anchorage in Cala Coticcio.

Charts 3914, 2157.

Off-lying islets and dangers.—**Lights.**—**Buoy.**—Isolotti Monaci (*Lat.* 41° 13' N., *Long.* 9° 31' E.) are a group of rocky islets situated on a steep-to, detached shoal, about 1½ miles eastward of Punta Coticcio. The channel between the islets and the point is free from dangers. 50

Charts 1189, 161b, 1780, 676, 2158a.

Charts 3914, 2157.

A light is exhibited, at an elevation of 57 feet (17^m4), from a iron framework structure on a square masonry hut, 30 feet (9^m1) in height, situated on the summit of the south-westernmost of Isolotti Monaci.

- 5 Secca dei Monaci, with a depth of 9 feet (2^m7), lies about one mile eastward of Isolotti Monaci, and from it a shoal bank extends about one cable north-westward. A red conical buoy, surmounted by a globe, is moored close southward of Secca dei Monaci. The beacon on Monte Guardia del Turco, *see* page 234, bearing 290°, and well open northward of the north-eastern extremity of Isola di Caprera, leads about 4 cables north-eastward of Secca dei Monaci. Capo Ferro main lighthouse in line with the eastern extremity of Isola delle Bisce, *see* below, bearing 201°, leads about 6 cables south-eastward of the shoal, but towards Secca delle Bisce. Secca dei Monaci is covered by the red sector of the light on Isolotti Monaci, between the bearings of 250° and 265°. It is also covered by the red sector of the lower light at Capo Ferro main lighthouse, between the bearings of 189° and 203°.

A rock, with a depth of 43 feet (13^m1), lies about 5 cables east-north-eastward of Isolotti Monaci.

- 20 Secca delle Bisce, with a depth of 15 feet (4^m6), rock, lies about 2 miles south-south-eastward of Isolotti Monaci and about 1½ miles north-north-eastward of Isola delle Bisce. Secca delle Bisce is covered by the red sector of the light on Isolotti Monaci, between the bearings of 319° and 352°, and also by the red sector of Capo Ferro main light, between the bearings of 189° and 203°.

- Isola delle Bisce, 69 feet (21^m0) high, is barren, and, lying close northward of Capo Ferro, is not easily distinguished from the land behind it. The southern side of the islet is steep-to, but the northern side is foul, and from it a shoal bank, on which lie numerous above-water rocks, extends about 4 cables northward. A rocky patch, with a depth of 19 feet (5^m8), lies about 3 cables west-north-westward; and Secca Pecora, with a depth of 16 feet (4^m9), rock, lies about 5 cables north-westward of the western extremity of Isola delle Bisce.

- A light is exhibited at an elevation of 33 feet (10^m1) from a small white conical tower, with black stripes, 31 feet (9^m4) in height, situated near the middle of the southern side of Isola delle Bisce.

- Capo Ferro.—Lights.—Signal station.—Storm signals.**—This cape, the north-eastern extremity of Sardinia, lies about 2 miles south-eastward of Isolotto Pecora. It is dark, steep-to, rugged, and rises, about a cable inland, to an elevation of 124 feet (38^m8), *see* view facing page 244. A bank, with a depth of 29 feet (8^m8) over its extremity, extends 2 cables from the coast about 3½ cables south-eastward of Capo Ferro, and about 7½ cables farther south-eastward, Secche del Cervo, with a depth of 7 feet (2^m1), rock, lies within 6 cables of the coast. Punta Teialone, *see* page 241, bearing 318°, and open north-eastward of Isola delle Bisce, leads about 3 cables north-eastward of Secche del Cervo.

- Two lights, disposed vertically, are exhibited, at elevations of 171 and 139 feet (52^m1 and 42^m4), from a yellow, circular tower surmounting a yellow, two-storied building, 59 feet (18^m0) in height, situated on Capo Ferro. *See* view facing page 231.

A light is exhibited, at an elevation of 30 feet (9^m1), from a small white conical tower, with red stripes, situated on the north-eastern extremity of Capo Ferro, about 1½ cables north-eastward of the main lighthouse (Lat. 41° 09' N., Long. 9° 31' E.).

Charts 163, 1189, 161b, 1780, 676, 2158a.

Charts 3914, 2157.

Eastern approach to Rada di Santo Stefano.—Dangers.—
Lights.—Buoyage.—This channel is entered between Isolotto Pecora
 and Capo Ferro, and in its approach are the islets and dangers described
 above. The deep channel between Isolotto Pecora and the dangers 5
 north-westward of Isola delle Bisce is about one mile wide, and
 that between the latter island and Capo Ferro is about 3 cables
 wide.

Isolotto Cappuccini, 75 feet (22^m9) high, lies about one-quarter of
 a mile west-north-westward of the western extremity of the promontory 10
 of which Capo Ferro is the north-eastern extremity, and the passage
 between it and the mainland is shoal.

Liscia di Vacca is entered between Isolotto Cappuccini and Punta
 Battistone, about three-quarters of a mile south-westward. The
 western side of the cove and its head are fringed by a shoal bank, on 15
 which lie some rocks. A shoal bank extends about 1½ cables north-
 westward from Punta Battistone.

Chart 2157.

Capo Tre Monti, the eastern entrance point of Golfo di Arzachena
 (Arsachena), *see* page 244, lies about 8½ cables westward of Punta 20
 Battistone, and the coast between them is fringed with shoals and in it
 are two coves. The cape derives its name from three smooth, light-
 coloured, rocky outcrops, of moderate elevation, the northernmost of
 which is rounded and surmounted by a square column.

Punta Rossa, on the northern side of the channel, is the southern 25
 extremity of Isola di Caprera; it is the extremity of a long narrow
 peninsula. This peninsula may be easily identified by the sheds,
 walls and bastions of the works on it. From the point, Secca di Punta
 Rossa extends about 1½ cables south-westward, and is marked on its
 southern side by a red conical buoy, surmounted by a ball. 30

A light is exhibited, at an elevation of 28 feet (8^m5), from an iron
 column surmounting a hut, 16 feet (4^m9) in height, situated on Punta
 Rossa.

A light is exhibited, at an elevation of 20 feet (6^m1), from an iron
 framework structure situated on the head of a small wharf on the 35
 western side of the peninsula of which Punta Rossa is the southern
 extremity.

Secca di Tre Monti, with a depth of 2½ fathoms (5^m0), lies in the
 middle of the channel between Punta Rossa and Capo Tre Monti.
 A cylindrical light-buoy, painted red, inscribed *Tre Monti* in white, 40
 and exhibiting a *red flashing* light showing a *short flash every five*
seconds, is moored close northward of Secca di Tre Monti. The south-
 western extremity of Isola Santo Stefano bearing 300°, and open north-
 eastward of Capo d'Orso, leads about 2½ cables north-eastward of
 the shoal. 45

Isolotto Porco (*Lat.* 41° 10' N., *Long.* 9° 28' E.), about half a mile
 north-westward of Punta Rossa, is 82 feet (25^m0) high, and is fringed
 with rocks and shoals. A 4½-fathom (8^m2) patch lies about 2 cables
 south-south-westward of the islet.

Punta Saline, the western entrance point of Golfo di Arzachena, lies 50
 about 1½ miles north-westward of Capo Tre Monti.

Golfo delle Saline is entered between Punta Saline and Punta Capra,
 about three-quarters of a mile north-north-westward, and its head is
 shoal. A can buoy is moored in the middle of this gulf.

Charts 163, 1189, 161b, 1780, 676, 2158a.

Chart 2157.

Between Punta Capra and Capo d'Orso, *see* page 239, the coast is steep-to, and in it is a cove with a boat landing-place near a white house.

Porto Palma, on the southern side of Isola di Caprera, is approached
5 between Isolotto Porco and Punta Fico, *see* page 240. A rock, with a depth of $5\frac{1}{2}$ fathoms (10^m1), lies about $6\frac{1}{2}$ cables westward of Isolotto Porco. The depths in the inner half of Porto Palma are less than 5 fathoms (9^m1), and a shoal bank, on which lie some rocks, extends from its head.

- 10 **Anchorage.**—Anchorage could be obtained in Liscia di Vacca, but it is exposed to north-westerly winds, and to the swell from north-eastward.

Small vessels, with local knowledge, can obtain anchorage eastward of Isolotto Porco, in depths of from 7 to 9 fathoms (12^m8 to
15 16^m5).

Anchorage, sheltered from north-westerly winds, can be obtained in Golfo delle Saline, in depths of from 8 to 10 fathoms (14^m6 to 18^m3), weed, about $2\frac{1}{2}$ cables southward of Punta Capre.

Small vessels, with local knowledge, can obtain sheltered anchorage
20 in Porto Palma.

Golfo di Arzachena.—Beacons.—Caution.—Golfo di Arzachena (Arsachena) is entered between Capo Tre Monti and Punta Arzachena, about one mile west-south-westward; its shores are fringed with shoal banks on either side.

- 25 About 3 cables southward of Punta Arzachena is a rock, marked by an iron staff, surmounted by a white ball.

Isolotto Pa lies about 6 cables southward of Punta Arzachena, and north-westward of it is a boat landing-place. This islet is low, rocky and of a deep yellow colour.

- 30 **Anchorage.**—Anchorage can be obtained, by vessels with local knowledge, eastward of Isolotto Pa, in a depth of about 8 fathoms (14^m6), sand and weed, but northward of this position depths of less than 5 fathoms (9^m1) extend 4 cables from the eastern shore of the gulf.

35 *Charts 161a and b.*

- EASTERN SIDE OF SARDINIA.—General remarks.**—The coast on this side of the island trends northward and southward, and except within about 20 miles of its northern end and 5 miles of its southern extremity there are no off-lying islands. In most places
40 the coast is comparatively steep-to. Capo Figari and Isola Tavolara are the most prominent features.

Chart 3914.

- Coast.—Dangers.**—Punta Cervo lies about $1\frac{1}{2}$ miles south-south-eastward of Capo Ferro, *see* page 242, and within 6 cables north-eastward of it lie Secche del Cervo (*Lat.* $41^\circ 09' N.$, *Long.* $9^\circ 33' E.$).
45

Porto Cervo is entered between Punta Cervo and a point about one cable southward.

- Golfo Pevero is entered between Punta Pevero, about half a mile south-eastward of Punta Cervo, and a point about one mile farther
50 south-eastward. Its shores are fringed with rocks and shoals, and a rock, with a depth of one foot (0^m3), lies about $1\frac{1}{2}$ cables off its south-eastern side. Monte Zoppo, barren and reddish in colour, rises to an elevation of 456 feet (139^m0) immediately within the south-eastern

Charts 1780, 676, 2158a.

a



Porto
Corvo.
Capo Ferro
main lighthouse,
bearing 107°,
4 miles.

Capo Tre
Monti.

a

a



Isola Caprera.

Isola
Razzoli
lighthouse.
Isolotti
Corcelli.

View, in two parts, of Capo Ferro from north-north-eastward.
(Original dated 1882.)

a



Capo Figari
signal station.

Monte Sa Curi.

Monte
Limbara.

Monte
Congianus.

Golfo di Congianus from north-eastward.
(Original dated 1880.)



*Isolotto
Molarotto.*

*Disused
lighthouse.*

*Punta
Timone
bearing 275°,
15 miles.*

Monte Sa Curi.

*Isolotto
Figarello.*

*Capo
Figari.*

Punta Timone from eastward.
(Original dated 1883.)



*Punta
Maggiore.*

*Punta d'Ottolò,
bearing about 296°,
about 7½ miles.*

*Punto
Brandinchi.*

Isola Molara.

Punta Maggiore from eastward.
(Original dated 1889.)

Chart 3914.

entrance point, and is prominent; close eastward of this point is an islet, 59 feet (18^m0) high, with some rocks on its north-eastern side. Monte Moru, bare and rugged, with a pyramid on its summit, rises to an elevation of 1,279 feet (389^m8) about 2½ miles westward of Monte Zoppo. 5

Isole dei Nibani, lying within one mile northward of the south-eastern entrance point of Golfo Pevero, do not exceed 90 feet (27^m4) in height, and are difficult to distinguish from the land behind them. They are fringed with rocks and shoals, and between them and the coast is Passo delle Galere, a channel, about one cable wide, with depths of 36 feet (11^m0) in the fairway, which can be taken by vessels with local knowledge, by day. 10

Anchorage.—Porto Cervo affords anchorage to small vessels with local knowledge, but it is exposed to easterly winds. 15

Golfo Pevero is open north-eastward, but affords sheltered anchorage during south-easterly and south-westerly winds, in depths of from 6 to 8 fathoms (11^m0 to 14^m6).

Golfo di Congianus.—**Dangers.**—This gulf (*see* view facing page 244) is entered between Punta Capaccio, about one mile southward of the south-eastern entrance point of Golfo Pevero, and Capo Figari, about 7½ miles south-eastward. Its shores are high, rocky, indented, but there are some stretches of sandy beach. 20

Punta Capaccio is fringed with a shoal bank that extends about one cable south-south-eastward from it. 25

Isole Poveri, bare, reddish and surrounded by rocks and shoals, lie within three-quarters of a mile south-eastward of Punta Capaccio, with a detached rocky shoal close southward of them. The deep channel between these dangers and the coast is about one-quarter of a mile wide. 30

Isola Mortorio, reddish, rugged and bare, is 250 feet (76^m1) high at its north-eastern end, and lies about 2 miles south-eastward of Punta Capaccio; its eastern side is fairly steep-to, but the north-western and southern ones should not be approached within 2 cables. There is a cairn on its summit. 35

Isole Mortoriotto, two detached, dark, steep-to rocks, lie close together about half a mile north-eastward of the north-eastern extremity of Isola Mortorio (*Lat.* 41° 05' N., *Long.* 9° 37' E.).

Isole Camize are bare and reddish and lie on a rocky shoal about half a mile westward of the western extremity of Isola Mortorio, with a narrow but navigable channel between. 40

Isola Soffi, 105 feet (32^m0) high at its north-eastern end, lies about one mile south-westward of Isola Mortorio.

Le Camere, respectively, 62 and 85 feet (18^m9 and 25^m9) high, rugged and covered with sparse vegetation, lie close north-eastward of Isola Soffi, with dangerous rocks within 1½ cables northward and southward of them and a detached 23-foot (7^m0) shoal close north-eastward of the north-eastern islet. 45

Cala di Volpe is entered between Punta Capriccioli, about 1½ miles south-westward of Punta Capaccio, and Punta Ligata, nearly one mile further south-south-westward. 50

Punta Ligata is low and fringed by a shoal bank extending a short distance offshore. Cala Liscia Ruia (Ruja), on the southern side of the point, is shoal and encumbered with rocks.

Charts 161b, 1780, 676, 2158a.

Chart 3914.

Golfo di Cugnena (Cognena) is entered between Punta Ligata and Punta Volpe, about $1\frac{1}{2}$ miles south-south-eastward, and its inner part, named Porto Cugnena, is shoal.

- 6 Monte Congianus, *see* chart 161b, rises to an elevation of 2,129 feet (648^m9) about $1\frac{1}{2}$ miles north-westward of the head of Porto Cugnena, and may be identified by a small saddle in the summit.

Razza di Giunco lies on the north-western side of Golfo di Cugnena.

- 10 Isolotto Portisco, at the southern end of Razza di Guinco, lies close inshore and is surrounded by rocks and shoals.

Porto Rotondo, the eastern of two coves on the southern side of Golfo di Cugnena, affords complete shelter to small craft with local knowledge.

- 15 Punta Volpe is the north-eastern extremity of a small peninsula fringed with rocks and shoals.

Golfo di Marinella is entered between Punta Volpe and Punta Canisone, about $1\frac{1}{2}$ miles south-eastward, and its shores are much indented. Anchorage is prohibited in this gulf.

- 20 Marinella Vecchia, Marinella Nuova, and Cala Sabina are three coves near the head of Golfo di Marinella; at the head of the first-named is a hut, where a submarine telegraph cable, *see* page 19, the route of which is indicated on the chart by a wavy line, is landed.

- A rocky shoal, with depths of from 6 to 8 feet (1^m8 to 2^m4), extends about $1\frac{1}{2}$ cables north-westward of Punta Canisone. Between Punta 35 Canisone and Punta Mortale, about half a mile south-eastward, the coast should not be approached within $2\frac{1}{2}$ cables. From Punta Mortale, the coast trends about 3 miles south-eastward to Capo Figari, and near the middle of this stretch is Punta di Spada. Anchorage is prohibited off this part of the coast.

- 30 Between Punta Mortale and Punta di Spada are three conspicuous radio masts, 75 feet (22^m9) high.

- Anchorage.**—Cala di Volpe affords good shelter from north-westerly winds, in a depth of 11 fathoms (20^m1), sand and weed, about half a mile south-westward of Punta Capriccioli. Small vessels, with 35 local knowledge, can obtain shelter from easterly winds in the northern part of the cove.

In fine weather, anchorage can be obtained in the outer part of Golfo di Cugnena. Small vessels, with local knowledge, can anchor in the entrance to Porto di Cugnena.

- 40 Razza di Giunco affords anchorage, in a depth of 4 fathoms (7^m9), about $1\frac{1}{2}$ cables offshore.

- Capo Figari.**—This cape (*Lat.* 41° 00' N., *Long.* 9° 40' E.), the eastern extremity of a prominent rocky peninsula, 1,115 feet (339^m8) high, is steep-to, and is flanked by high cliffs, with precipitous edges 45 and large fissures in places, rising from the sea and riddled with caves. The northern slopes of the peninsula are whitish in colour, and the peninsula itself is covered with bushes and dwarf trees of a dark green colour.

- A signal station, open for public correspondence, is established on 50 the summit of the peninsula.

Chart 163, plan of Golfo degli Aranci.

Golfo degli Aranci.—**Dangers.**—**Lights.**—This bay is bounded on its north-eastern side by the peninsula of which Capo Figari is the eastern extremity.

Charts 161b, 1780, 676, 2158a.

Chart 163, plan of Golfo degli Aranci.

Isolotto Figarello, 426 feet (129^m8) high, lies about 1½ miles south-westward of Capo Figari, *see* chart 163, and is covered with bushes and undergrowth. A bank, with depths of less than 3 fathoms (5^m5), extends about one cable from the north-western side of the islet, and the passage between the latter and the southern side of the peninsula is about 1½ cables wide, but it should only be attempted by small vessels with local knowledge. 5

A light is exhibited, at an elevation of 236 feet (71^m9), from a masonry tower, 23 feet (7^m0) in height and painted black and white in horizontal bands, situated on the south-eastern slope of Isolotto Figarello. 10

Cala Moresca, on the southern side of the peninsula, northward of Isolotto Figarello, affords shelter only to boats.

Punta delle Casette, the south-western entrance point of Golfo degli Aranci, lies about 2½ miles west-south-westward of Isolotto Figarello, and about 2 cables eastward of it is a detached 5-fathom (9^m1) patch. A shoal, with a depth of 1½ fathoms (2^m7), lies about 3½ cables north-north-westward of the point, and Isolotto Porri, low, rocky, covered with vegetation and 30 feet (9^m1) high, lies close inshore about 6½ cables south-south-westward of the point. 20

Porticciolo, a cove about 1½ miles northward of Punta delle Casette, affords shelter from offshore winds to small craft with local knowledge, but off it the depths are shoal, and in its approach is Tandy islet, 8 feet (2^m4) high. 25

A white truncated pyramidal beacon on a square base, 5 feet (1^m5) high, marks the edge of the coastal bank in the northern corner of the bay about 2 miles north-north-eastward of Punta delle Casette.

Golfo Aranci, a small fishing village, stands on the north-eastern side of the head of the bay; the most prominent buildings in it are the yellowish railway station, with its red roof, the post office at the root of the mole, and Villa Tamponi, with a windmill attached to it, but the latter is partly hidden by a grove of pine trees between it and the railway. North-westward of the village stand four radio masts, close to which are two reddish buildings. 35

A mole, about half a cable long, extends from the shore abreast the village, and is connected with the railway system. On the northern side of the root of the mole there is a boat camber with a short mole on its northern side. A light is exhibited, at an elevation of 26 feet (7^m9), from an iron support on a white masonry hut, situated on the head of the mole. 40

In 1947, it was reported that the main mole was in a damaged condition, and that only the north-western side was available for use.

A 2½-fathom (4^m1) rocky patch lies about one cable south-south-eastward of the head of the mole (*Lat.* 41° 00' N., *Long.* 9° 37' E.). 45

Anchorage.—There is anchorage about 4½ cables southward of the head of the mole, sheltered from north-westerly and north-easterly winds; but south-easterly winds, if strong, send in a heavy swell, and strong westerly winds hamper communication with the shore. The bottom is mud and the holding ground is good. 50

Small vessels can obtain anchorage, in depths of 23 feet (7^m0), in the entrance to the cove close westward of Isolotto Porri.

Port facilities.—There is a small hospital at Golfo Aranci.

Fresh provisions can be obtained from Olbia, *see* page 251.

Charts 161b, 1780, 676, 2158a.

Chart 3913.

Golfo di Olbia.—Dangers.—Buoyage.—This bay, at the head of which is Porto di Olbia, is entered between Punta delle Casette and Capo Ceraso, about $3\frac{1}{2}$ miles south-eastward. From Punta delle
 5 Casette, the coast trends about $2\frac{1}{2}$ miles south-south-westward to Punta Figlio, and is indented by several small bays. This stretch of coast should not be approached within one-quarter of a mile, and Secca dei Porri, with a depth of 11 feet (3^m4), about 4 cables offshore and $1\frac{1}{2}$ miles south-south-westward of Punta delle Casette, must be
 10 avoided.

Monte Sa Curi, 1,361 feet (414^m8) high, is a prominent peak about $2\frac{1}{2}$ miles westward of Punta delle Casette, with another peak, not so high and less sharp, southward of it.

Capo Ceraso is the north-eastern extremity of a promontory on
 15 which Monte Maladormida, rounded and prominent, rises to an elevation of 715 feet (217^m9); a white pyramidal masonry beacon stands near its summit. A shoal bank, on which lies Isolotto Barco Sconcia, extends about 4 cables eastward from the cape, its north-eastern extremity being marked by a conical buoy, painted red and white in horizontal
 20 bands, surmounted by a black cone and inscribed *Capo Ceraso* in black. A white truncated pyramidal beacon on a square base inscribed *Capo Ceraso*, and 13 feet (4^m0) high, marks a rock close north-eastward of Isolotto Barco Sconcia (*Lat. $40^\circ 55' N.$, Long. $9^\circ 39' E.$*).

A white pyramidal beacon stands on an islet about $1\frac{1}{2}$ cables north-
 25 westward of Capo Ceraso.

Punta Ruia (Ruja), about one mile westward of Capo Ceraso, is 115 feet (35^m0) high and prominent; it is surmounted by a white, pyramidal masonry beacon. About midway between the point and the cape, a shoal bank extends about 3 cables northward from the
 30 coast and its extremity is marked by a conical light-buoy, painted red and exhibiting a *red flashing light every three seconds*. Isolotto Bocca light, *see* page 249, is obscured over the outer part of this shoal when bearing more than 264° .

From Punta Ruia, the coast trends about 2 miles south-westward to
 35 the head of Liscia delle Saline, and is fringed by a bank, which, with depths of less than 18 feet (5^m5), extends as much as 3 cables offshore in places.

Porto Vitello, about one-quarter of a mile south-westward of Punta Ruia, is a small shallow cove available only to small craft with local
 40 knowledge.

Liscia delle Saline is open north-eastward; an islet lies on a shoal bank which encumbers its head. The shore at the head of Liscia delle Saline is low and marshy.

Anchorage.—During offshore winds, anchorage can be obtained
 45 in Liscia delle Saline, in depths of 20 feet (6^m1).

Chart 3609.

Porto di Olbia.—This harbour is approached between Punta Figlio and Punta Saline, about three-quarters of a mile southward, and is entered northward of Isolotto Bocca. On either side of the
 50 entrance, and of the fairway within it, are shoals and rocks. The least depth in the entrance channel, which is less than three-quarters of a cable wide, and in the fairway as far as the head of the mole was, in 1939, 21 feet (6^m4); 19- and 20-foot (5^m8 and 6^m1) patches lie about one cable from the southern shore about 9 and $7\frac{1}{2}$ cables westward;

Charts 161b, 676, 2158a.

Chart 3609.

and a 19-foot (5^m8) patch lies northward of the fairway about 6½ cables west-north-westward of Isolotto Bocca.

Considerable parts of the land surrounding the harbour are low, marshy, and unhealthy, and on the southern side of the harbour is the delta of Fiume Padrogiano. 5

At the head of the harbour, which is much obstructed by islets, shoals, and rocks, is the town of Olbia, whence a mole extends about three-quarters of a mile eastward, connecting Isola Fiorita and Isola Bianca with the shore. Northward of this mole is the approach to Porto Romano, and southward of it is the approach to the wharves. 10

The least depth in the fairway across the bar in the approach to Porto Romano is 15 feet (4^m6), and the port itself is shallow; but between the bar and the port there are depths of from 16 to 24 feet (4^m9 to 7^m3). 15

There are depths of 20 feet (6^m1) and from 12 to 20 feet (3^m7 to 6^m1) along the northern and southern sides, respectively, of the head of the mole extending eastward from Isola Bianca; the mole is connected with the railway system. 20

The least depth in the fairway to the wharves at the town is 15 feet (4^m6), but the channel is tortuous and narrow, and is only suited to vessels of moderate length.

Fronting the town are two wharves extending, respectively, southward and east-south-eastward from the shore. The first, Banchina Vecchia, is connected with the railway system, and has depths alongside of from 13 to 18 feet (4^m0 to 5^m5), and Pontile Benedetto Brin, the second, southward of Isolotto Lucrea, has depths of about 20 feet (6^m1) alongside its southern side. Harbour works were in progress in 1951. 25 30

Lights. — **Fog signal.** — **Buoyage.** — **Beacons.** — A light is exhibited, at an elevation of 80 feet (24^m4), from a white square tower surmounting a white two-storied building, 72 feet (22^m0) in height and inscribed *Faro di Isola Bocca*, situated on Isolotto Bocca. A fog signal is sounded at the lighthouse (*Lat. 40° 55' N., Long. 9° 34' E.*). 35

Two light-buoys mark the edges of the shoals on either side of the fairway northward of Isolotto Bocca. The northern one is painted black and exhibits a *green fixed* light, and the southern one is painted red and exhibits a *red fixed* light.

Two light-buoys mark the fairway at the inner end of the entrance, about 4½ cables westward of Isolotto Bocca. The northern one is painted black and exhibits a *green flashing* light *every three seconds*, and the southern one is painted red and exhibits a *red light every three seconds*. 40

A can light-buoy, painted red and exhibiting a *red occulting* light *every four seconds* eclipse *two seconds*, is moored about 9 cables westward, and a similar buoy is moored about 1½ miles westward of Isolotto Bocca. 45

A light is exhibited, at an elevation of 15 feet (4^m6), from a white iron column situated on the head of the mole. 50

A beacon, consisting of an iron staff with a red conical topmark, 16 feet (4^m9) high, marks a 6-foot (1^m8) shoal about 1½ cables north-north-westward of the head of the mole.

A white conical buoy, with a white conical topmark, marks the north-

Chart 3609.

western side of Secca Cavallo, a detached 10-foot (3^m0) patch about $2\frac{3}{4}$ cables east-south-eastward of the head of the mole.

- A white conical buoy is moored on the southern side of the fairway
 5 about $1\frac{1}{2}$ cables southward of the head of the mole.

A light is exhibited, at an elevation of 13 feet (4^m0), from a black column on a masonry base, 10 feet (3^m0) in height, situated on the northern side of the channel about $3\frac{1}{2}$ cables west-south-westward of the head of the mole.

- 10 The northern side of the channel is marked by a red conical buoy, surmounted by a cylinder, moored about half a cable north-westward of the above light-beacon, and by a black conical buoy, surmounted by a cone, moored about $1\frac{1}{4}$ cables west-north-westward of the light beacon.

- 15 The southern side of the channel is marked by three red conical buoys; the outer buoy surmounted by a cone and the others by cylinders. The rocks on the shoal bank on the southern side of the channel are marked by beacons.

- A light is exhibited, at an elevation of 23 feet (7^m0), from an iron
 20 column, 21 feet (6^m4) in height, situated on the head of Banchina Vecchia.

There are several mooring and warping buoys in the port.

Charts 3609, 3913.

- Anchorage.—Regulations.**—Vessels, unable to enter the port,
 25 can obtain temporary anchorage, in depths of about 11 fathoms (20^m1), about one mile eastward of Punta Figlio, or about 3 cables eastward of that point, in a depth of about 7 fathoms (12^m8); but there are depths of 29 feet (8^m8) about 7 and $4\frac{1}{2}$ cables east-north-eastward and $5\frac{1}{4}$ and $6\frac{3}{4}$ cables eastward of Isolotto Bocca.

- 30 Vessels that can enter the port can obtain secure anchorage, in depths of from 21 to 27 feet (6^m1 to 8^m2), about 4 cables west-south-westward of Punta Ginepro (*Lat.* $40^\circ 56' N.$, *Long.* $9^\circ 33' E.$), situated near the middle of the northern side of the harbour, but there is an 18-foot (5^m5) patch in the vicinity.

- 35 Vessels drawing less than 15 feet (4^m6) can obtain anchorage in the approach to Porto Romano.

Pilotage is compulsory; *see* page 20.

- No vessel, except the mail steamer, is allowed to approach
 40 the southern side of the head of the mole extending from Isola Bianca.

To facilitate the entry and egress of the mail steamer, between the hours of 0000 and 0900 and between 1900 and 2100, all sailing vessels and boats must keep clear of the fairway between Isolotto Bocca and the head of the mole extending from Isola Bianca.

- 45 No vessel or boat is permitted to enter the area bounded southward by the mole extending to and beyond Isola Bianca, westward and northward by the shore, and eastward by the meridian of the head of the mole, unless specially authorised by the officer in charge of the airport. All small craft should endeavour to keep out of the way of aircraft anywhere within Porto di Olbia. *See* also page 23.

In 1947, the above regulations, in so far as they refer to the channel leading to the wharves southward of the mole, were suspended.

Port facilities.—The principal exports are cattle, cork, wool, and cheese.

Charts 163, 161b, 676, 2158a.

Charts 3609, 3913.

¶ Fresh provisions in small quantities are available, and drinking water can be obtained at the wharves.

Minor repairs could be effected. A 25-ton hand crane is available. *Chart 3913.*

Coast.—Dangers.—Punta Coda Cavallo lies about 6 miles south-eastward of Capo Ceraso, and between them the coast is much indented, with two islands and some islets and rocks off it.

Golfo Sparlatta is entered between Capo Ceraso and the north-western side of Isola Tavolara, about $1\frac{1}{4}$ miles south-eastward. Its north-western shore trends about $1\frac{1}{4}$ miles south-westward from abreast Isolotto Barco Sconcia and is fringed with rocks and shoals extending as much as 3 cables offshore in places.

Porto Istano, at the head of Golfo Sparlatta, affords shelter to small craft with local knowledge, but strong north-easterly and south-easterly winds send in a heavy sea.

Isola Piana, 49 feet (14^m9) high, and Isola Cavalli, 20 feet (6^m1) high, lie on the south-eastern side of Golfo Sparlatta, and are connected with each other and with the shore south-westward by a shoal bank. A detached 10-foot (3^m0) patch lies about $2\frac{1}{2}$ cables north-north-westward of Isola Cavalli.

Porto San Paolo, southward of the above-mentioned islets, is only available to small craft with local knowledge.

Punta La Greca lies about half a mile southward of Isola Piana, and from it shoals extend about $1\frac{1}{2}$ and 3 cables northward and north-eastward, respectively.

Isolotto Reulino (*Lat.* $40^{\circ} 53' N.$, *Long.* $9^{\circ} 40' E.$), 36 feet (11^m0) high and noticeable because of its reddish colour, lies about three-quarters of a mile eastward of Punta La Greca, and the channel between it and the coast is obstructed by rocks and shoals.

Porto Taverna is entered between Isolotto Reulino and Isolotto Cana (Mezzo), about three-quarters of a mile south-south-eastward. Its shores are fringed by a bank which, with depths of less than 36 feet (11^m0), extends as much as $4\frac{1}{2}$ cables offshore, and a detached 23-foot (7^m0) patch lies about 4 cables west-south-westward of Isolotto Cana.

Isolotto Cana (Mezzo) is smooth, rocky, and of a greyish colour; it lies about one-quarter of a mile north-westward of Punta Monte Pedrosu, with which it is connected by a shoal bank.

From Punta Monte Pedrosu the coast trends south-eastward and is indented by several unimportant coves, the largest and south-eastern-most being Cala Coda Cavallo.

Cala Coda Cavallo is entered between Punta Sugaraccia, and Isola Proratora, a reddish islet close north-westward of Punta Coda Cavallo, about 4 cables east-north-eastward.

Punta Coda Cavallo is red in colour, and is the extremity of a small peninsula.

Off-lying islands.—Dangers.—Light.—Isola Tavolara, *see* view facing page 245, is a narrow, almost inaccessible island, 1,847 feet (563^m0) high, at the summit of Punta Cannone, near its south-western end, and its south-eastern and north-western coasts are steep-to.

Punta Timone, at the north-eastern extremity of Isola Tavolara, is the northern extremity of a small peninsula, 607 feet (185^m0) high, *see* view facing page 245. On either side of the isthmus of Punta

Charts 161b, 676, 2158a.

Chart 3913.

Timone peninsula is a cove ; Cala del Faro, on the eastern side, is the larger ; that on the western side is foul.

A light is exhibited, at an elevation of 236 feet (71^m9), from a white octagonal masonry tower, 23 feet (7^m0) in height, situated on Punta Timone. Distress signals are displayed ; see page 13.

Punta Papa is the eastern extremity of Isola Tavolara, and close northward of it is a disused lighthouse.

From the south-western extremity of Isola Tavolara, a low, narrow, sandy peninsula extends about three-quarters of a mile south-westward. The north-western side of this peninsula is fronted by a shoal bank extending as much as 6½ cables offshore, and on it lie Isolotto Verde and Isolotto Spalmatore. A shoal, with a depth of 3 feet (0^m9), lies about 1½ cables south-eastward of Isolotto Spalmatore. A shoal bank extends about 3 cables westward and southward from the extremity of the peninsula.

Spalmatore di terra is a bight on the southern side of the above-mentioned peninsula. There are some houses at the head of the bight, and on its eastern side is a conspicuous square lime-kiln.

Isola Molara is 531 feet (161^m8) high, and is situated between Isola Tavolara and Punta Coda Cavallo, with navigable channels on either side of it. It is partly overgrown with bushes and is cultivated in places ; its coasts are fringed, especially at its north-western end, with reefs and shoals, but they do not extend more than 3 cables offshore. The outermost dangers are an islet and some rocks awash, about one-quarter of a mile north-north-westward and northward, respectively, of Punta Chiriato, the western extremity of the island ; a rocky shoal, about 1½ cables from the western entrance point of Cala Chiesa, near the middle of the northern coast ; Scoglio Porri, awash, about 1½ cables offshore between Punta Arresto and Punta Porri, on the north-eastern side of the island ; and a 24-foot (7^m3) shoal, 2½ cables from the south-western coast, about midway between Punta Aja and Punta Chiriato.

Isola Molarotto (*Lat.* 41° 52' N., *Long.* 9° 47' E.) is conical, reddish in colour, 167 feet (50^m9) high, and surrounded by rocks. It lies about 1½ miles eastward of Punta Porri, and should not be approached within 2 cables.

Scogli Cervi, with two small above-water rocks on them, lie between half a mile and 1½ miles south-westward of Isola Molarotto. The passage between these shoals and Isola Molarotto should not be attempted, but that between the shoals and Isola Molaro is safe, if the coast of the island is kept well aboard.

Anchorages.—Golfo Sparlatta affords anchorage, sheltered from all but north-easterly winds, in depths of from 54 to 66 feet (16^m5 to 20^m1).

Small vessels, with local knowledge, can anchor southward of Isola Piana in a depth of about 36 feet (11^m0).

Porto Taverna affords anchorage, sheltered from all but north-easterly winds, in depths of 60 feet (18^m3), sand and weed, about 5½ cables south-south-westward of Isolotto Reulino.

Cala Coda Cavallo affords anchorage, in depths of from 33 to 46 feet (10^m1 to 14^m0) sheltered from all winds.

Cala del Faro affords anchorage, sheltered from south-westerly and north-westerly winds, in depths of from 48 to 66 feet (14^m6 to 20^m1).

Charts 161b, 676, 2158a.

Chart 3913.

Spalmatore di terra affords anchorage, exposed only to south-easterly winds, in a depth of 48 feet (14^m6) about 2 cables from the shore.

Anchorage, sheltered from south-easterly and south-westerly winds, can be obtained off Cala Chiesa by small vessels with local knowledge.

Porto Brandinghi.—This harbour is entered between Isola Rossa, about 1½ miles south-westward of Punta Coda Cavallo, and Scoglio Testa di Moro, 3½ cables further southward.

Isola Rossa is slightly reddish in colour and is easily identified. The passage between it and the coast northward of it is foul, and the coast between it and Punta Coda Cavallo is fringed with rocks and should not be approached within 1½ cables.

Scoglio Testa di Moro lies on a bank, which, with depths of less than 36 feet (11^m0), extends north-eastward of Punta Sabatino, situated about 1½ miles south-south-westward of Isola Rossa. Scoglio Testa di Moro is small, triangular in shape, and is not easily identified from a distance, especially in rough weather; there are no prominent landmarks in the vicinity. A shoal, with a depth of 19 feet (5^m8), lies about 4 cables westward of Scoglio Testa di Moro. Though there is a channel between these shoals, with a least depth of 26 feet (7^m9), it should not be attempted.

Punta Brandinghi is the extremity of a small promontory, 95 feet (29^m0) high, situated at the head of the harbour. This promontory is backed by marshy land, and separates two coves with white sandy beaches, the northern of which is Cala Capecciolo (Brandinghi).

Anchorage.—**Directions.**—Porto Brandinghi (*Lat.* 49° 50' N., *Long.* 9° 42' E.) affords anchorage, in depths of 42 to 52 feet (12^m8 to 15^m8), about 4½ cables westward of the southern extremity of Isola Rossa. Small vessels can obtain good anchorage in the entrance to Cala Capecciolo (Brandinghi), in depths of 23 feet (7^m0). The anchorage, however, is insecure during north-easterly winds, and south-easterly winds send in a heavy sea. A vessel approaching from north-eastward should steer with the above-water rocks on Scogli Cervi in line with the centre of Isola Molarotto, bearing 044°, astern, Scoglio Testa di Moro will then be sighted ahead. When Isola Rossa is abeam, the vessel should steer for the northern end of the white sandy beach in the southern of the two coves at the head of the harbour, bearing about 283°, passing from one cable to 1½ cables southward of the southern extremity of Isola Rossa, and anchoring as directed above. A vessel approaching from southward should steer for Punta Coda Cavallo until Isola Rossa can be identified.

Chart 161b.

Coast.—**Dangers.**—From Punta Sabatino, the coast trends about 18 miles south-south-eastward to Capo Comino, and differs greatly in aspect from that farther northward. Between the mountains and the coast are extensive plains, parts of which are marshy, but the coast itself is low, sandy, and in places noticeably white. The land is cultivated, and the farm buildings and scattered villages give to it an appearance contrasting strongly with the destitute and forsaken aspect of most parts of the island.

San Teodoro d'Ovidde, about 2½ miles southward of Punta Sabatino, is the first village. It is partly hidden from seaward by trees, but in it is a white belfry with a tall chimney close southward of it. The

Chart 161b.

coast northward and the point eastward of the village should be given a wide berth, for they are fringed with shoals.

Punta d'Ottiollo is a sharp rocky point, about $3\frac{1}{4}$ miles southward of Punta Sabatino, and about one mile southward of it Isolotto d'Ottiollo, low and inconspicuous, lies close inshore with a sunken reef extending about half a mile eastward from it.

Punta Maggiore, *see* view facing page 245, dark and conical, rises to an elevation of 3,186 feet (971^m1) about $6\frac{1}{2}$ miles west-south-westward of Punta d'Ottiollo.

Punta Sant' Anna lies about $3\frac{1}{2}$ miles southward of Punta d'Ottiollo, and near it is a low hill, close to the coast, with a long white scar on its slope, which, when seen from northward, has the appearance of a village.

Punta Pedrame (Pedrami) lies about 2 miles south-south-eastward of Punta Sant' Anna. Scoglio Pedrame, with some above-water rocks around it, extends about $1\frac{1}{4}$ miles eastward from the coast about three-quarters of a mile northward of Punta Pedrame. The passage between these rocks and the coast is only available to boats.

Monte Lungu rises to an elevation of 761 feet (232^m0) about one mile westward of Punta Pedrame, and from northward appears as a cone.

Punta Sa Caletta, about $3\frac{1}{4}$ miles southward of Punta Pedrame, can be identified by the white, circular Torre di San Giovanni close northward of it. Close southward of the tower is a group of buildings forming the hamlet of Sa Caletta. Near the coast southward of this hamlet are some rocks. The coast in the vicinity of Punta Sa Caletta is backed by marshes.

Posada, about $2\frac{1}{4}$ miles north-westward of Punta Sa Caletta, is a village on the steep slope of a small conical hill surmounted by an ancient castle, *see* view facing page 256.

Punta Santa Lucia, about 2 miles south-eastward of Punta Sa Caletta, is surmounted by a partly demolished grey circular tower, near which is a group of red houses and a long stretch of white sand which, when seen from northward, stands out from the dark green of the land behind it, but is not so conspicuous from southward.

Siniscola (*Lat.* 40° 34' N., *Long.* 9° 42' E.) is a village in which are a belfry with a small dark cupola and the gray cupola of the cathedral, and is situated about 4 miles westward of Punta Santa Lucia.

Anchorage.—Open anchorage can be obtained, in a depth of about 7 fathoms (12^m8), with Posada in line with Torre di San Giovanni, bearing about 315°. The coastal steamer calls regularly. A break-water extends about half a cable from the coast about three-quarters of a cable southward of Sa Caletta.

Capo Comino.—**Light.**—This cape is the eastern extremity of Sardinia, and is low, rocky, and fringed with reefs; it should not be approached within three-quarters of a mile. When approaching from northward, the extremity of the cape and the rocks off it are not distinguishable from the high land behind them; but from southward they are easily identified.

A light is exhibited, at an elevation of 390 feet (118^m9), from a white square masonry hut, 15 feet (4^m6) in height, situated on Capo Comino.

Isola Rossa, low, rocky, and reddish in colour, is surrounded by rocky shoals and lies close inshore on the northern side of Capo Comino.

Charts 676, 2158a.

Chart 161b.

In 1943, it was reported that a vessel drawing 19 feet (5^m8) touched bottom in a position 2 miles 156° from Capo Comino.

Monte Catirina, 3,701 feet (1,128^m0) high, and about 14 miles west-south-westward of Capo Comino, is at the south-western end of Monte Albo, a range of mountains which shows up white above the dark-coloured mountains in front of it, and is an excellent distant landmark. Punta Copetti rises to an elevation of 4,100 feet (1,249^m7) at the north-eastern end of Monte Albo.

Anchorage.—Anchorage, sheltered from south-westerly and north-westerly winds, can be obtained northward of Capo Comino, in a depth of 16 fathoms (29^m3), sand, about 6½ cables northward of Isola Rossa. Small vessels, with local knowledge, can obtain shelter from south-easterly winds, closer inshore, in depths of about 5½ fathoms (10^m1).

Coast.—Dangers.—From Capo Comino, the coast trends about 9½ miles south-south-westward to Punta Nera, and is backed by a chain of hills, partly overgrown with bushes but exhibiting large patches of reddish-coloured rock. It is fringed in many places with rocks, and should not be approached within three-quarters of a mile.

Punta Ginepro is a low point, fringed with rocks, about 5½ miles southward of Capo Comino, and close southward of it is Cala Ginepro.

Cala Liberotto, about one mile southward of Cala Ginepro, is only available to small craft with local knowledge.

Punta Nera is a low rounded projection of a colour somewhat darker than the land behind it.

Golfo di Orosei is entered between Punta Nera and Capo di Monte Santo, about 18 miles southward. For about 4 miles southward of the northern entrance point, the shore is fringed by a shoal bank, and should not be approached within one mile.

Orosei, with a population of 2,633, in 1941, lies about 2½ miles westward of Punta Nera, and in it is a square, greyish belfry.

Monte Tuttavista (*Lat.* 40° 23' N., *Long.* 9° 38' E.), 2,641 feet (805^m0) high, and about 2½ miles westward of Orosei, is prominent, *see* view facing page 256.

Punta Nera di Osalla, on the southern side of which is a cove, lies about 5 miles south-westward of Punta Nera, and is low and fringed with rocks. Southward of the cove, the shore becomes high and cliffy, with only here and there a short stretch of sandy beach.

Cala Gonone, about 3 miles southward of Punta Nera di Osalla, is the landing place for Dorgali, a town situated about 2½ miles inland. Coasting steamers call regularly. For about 2 miles southward of the cove, the coast is fringed with a shoal bank, with depths of less than 5½ fathoms (10^m1) extending about 1½ cables offshore; farther southward the coast is comparatively steep-to.

Capo di Monte Santo, *see* view facing page 256, is the extremity of a steep, rugged promontory, about 2,400 feet (731^m5) high, sloping towards the sea and terminating in high inaccessible cliffs. When seen from northward it appears as a slope with a large step; from eastward and south-eastward some reddish spots show up in its cliffs. From the cape, the high coast trends about 5 miles southward and is free from off-lying dangers, though there are a few rocks close inshore.

Punta Pedra Longa, about 4 miles south-south-westward of Capo di Monte Santo, is fronted by a detached, reddish column which, from southward, shows up well against the land.

Charts 676, 2158a.

Chart 161b.

Anchorage.—Cala Ginepro affords temporary anchorage to small vessels with local knowledge, but it is open eastward and south-eastward.

- 5 Small vessels, with local knowledge, can obtain open anchorage off the mouth of the stream on which stands Orosei.

Small vessels, with local knowledge, can obtain anchorage in Cala Gonone (*Lat.* 40° 17' N., *Long.* 9° 38' E.).

Charts 161a and b.

- 10 **Coast.—Dangers.**—Torre Santa Maria Navarrese is situated about 5½ miles southward of Capo di Monte Santo. The coast between is fringed with rocks about one cable offshore. Southward of the tower is a long stretch of sandy beach in which are the mouths of several streams.

- 15 Isolotto delle Ogliastro, 154 feet (46^m9) high, is a reddish-coloured, rocky islet, sparsely covered with vegetation, situated about one mile south-eastward of Torre Santa Maria Navarrese. Rocks extend for a short distance from its north-eastern side, and in the channel between it and the coast, which is about half a mile wide, there are depths of 20 4½ fathoms (8^m2). The islet is covered by a *red* sector, about 15° in extent, of the light at the head of the eastern breakwater at Arbatax, *see* below. The village of Lotzorai, about 2 miles westward of the islet, shows up well from seaward.

- Anchorage.**—Anchorage can be obtained about 2½ cables south-25 south-westward of Isolotto delle Ogliastro in a depth of 8 fathoms (14^m6), or about one cable westward of the islet, in a depth of 4½ fathoms (7^m8); but the locality is dangerous during south-easterly winds, and local knowledge is necessary.

- Coast.**—The district of Ogliastro, extending from Capo di Monte30 Santo to Monte Guadazzoni, about 21 miles southward, is undulating and of moderate elevation; it is cut off from the rest of the island by a chain of mountains. This district contains numerous villages and is extensively cultivated.

- Monti del Gennargentu, about 19 miles west-north-westward of35 Capo Bellavista, culminate in Punta La Marmora, 6,020 feet (1,834^m0), and Bruncu Spina, 6,003 feet (1,828^m9) high.

Chart 161a.

Girasole, a village on the north-western shore of Lago di Tortoli, 1½ miles southward of Lotzorai, is visible from seaward.

- 40 Golfo di Tortoli is entered between Isolotto delle Ogliastro and Capo Bellavista, about 2½ miles southward, and on its southern shore is Arbatax.

- Tortoli lies south-westward of Lago di Tortoli, about 2½ miles westward of Capo Bellavista, and in it is a cathedral with a cupola and45 a belfry.

Chart 1128, plan of pto di Arbatax.

- Arbatax.—Shoal.—Lights.**—This is the port of Tortoli, and the harbour is protected by two breakwaters. Molo di Levante extends about 2½ cables northward and westward from the northern50 extremity of Capo Bellavista. Molo di Ponente extends about 2½ cables east-north-eastward from the shore at the head of Golfo di Tortoli. The entrance faces north-westward. In 1951, operations were in progress to dredge this harbour to a depth of 16 feet (4^m9); the south-western part of the harbour is shoal. The holding ground is poor.

Charts 676, 2158a.

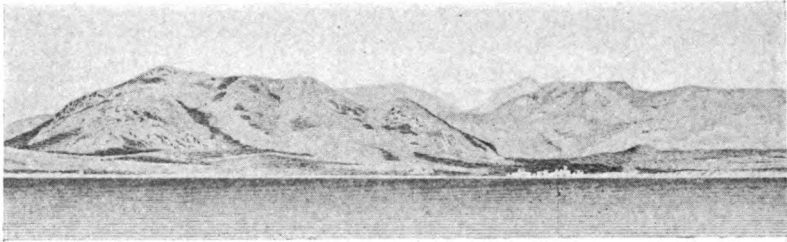


*Siniscola.
Torre di
San Giovanni.*

*Punta
Cupetti.*

*Posada,
bearing 242°, 7½ miles.*

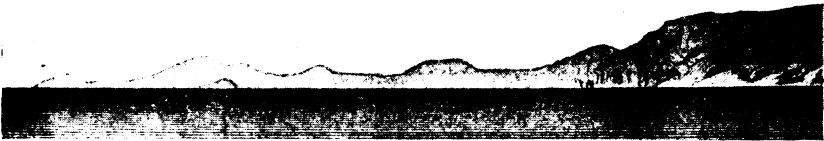
Posada from east-north-eastward.



Monte Tuttavista.

*Monte Catirina
Orosei,
bearing 309°, 10½ miles.*

Monte Tuttavista from south-eastward.

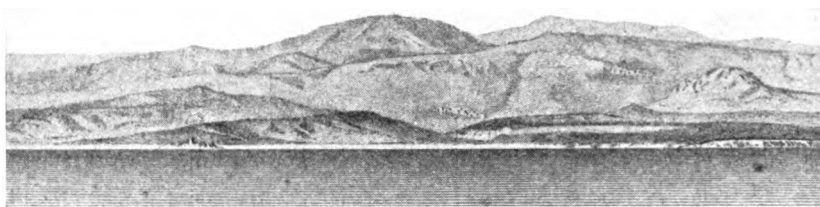


*Capo Bellavista
lighthouse.*

*Capo di Monte
Santo, bearing
209°, 13 miles.*

Capo di Monte Santo from north-north-eastward.

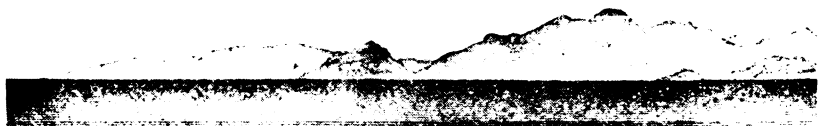
(Originals dated 1883.)



*Torre di Bari,
bearing 275°,
7 miles.*

Punta Nera.

Torre di Bari from eastward.



*Capo Sferracavallo,
bearing 202°, 20 miles.*

*Monte
Ferru.*

Capo Sferracavallo from north-north-eastward.



*Isola
Serpentara.*

*Capo
Ferrato.*

*Monte Ferru,
bearing 216°,
14½ miles.*

Capo Ferrato from southward.



*Summit,
bearing 233°,
20 miles.*

*Mouth
of Fiume
Flumendosa.*

*Torre di Porto
Corallo.*

Monte dei Sette Fratelli from north-eastward.

(Originals dated 1883.)

Chart 1128, plan of pto di Arbatax.

Capo Bellavista, the eastern side of which consists of steep cliffs that should be given a berth of at least $1\frac{1}{2}$ cables, is a rocky promontory with low land behind it, so that from northward or southward it appears as an island. The village of Arbatax stands on the northern side of the cape. On the western side of the village stands Torre di Arbatax, grey with a red roof (*Lat.* $39^{\circ} 56' N.$, *Long.* $9^{\circ} 42' E.$). 5

A light is exhibited, at an elevation of 541 feet (164^m), from a square, battlemented tower, 63 feet (19^m) in height, surmounting a two-storied building, the whole painted black and white in horizontal bands, inscribed *Bellavista*, and situated on Capo Bellavista. *See view facing page 231.* 10

Two lights are exhibited, at elevations of 46 and 33 feet (14^m and 10^m), from a small, circular stone tower, painted red and white in horizontal bands, situated on the head of Molo di Levante at Arbatax. 15

A shoal, with depths of from $1\frac{1}{2}$ to 3 fathoms (2^m to 5^m), lies within 4 cables of the shore and within the same distance north-north-westward of the head of the western breakwater.

At the head of the harbour is a tower near the mouth of a narrow channel forming the outlet of Lago di Tortoli. 20

Signal station.—Storm signals.—A signal station is situated at Capo Bellavista lighthouse. Storm signals, *see page 12*, are shown.

Port facilities.—Small quantities of provisions can be obtained at Tortoli.

Chart 161a. 25

Coast.—Dangers.—Porto Frailis is a cove, on the southern side of Capo Bellavista, with a 13-foot (4^m) shoal in the middle of it. On its western entrance point stands Torre San Gemiliano.

From Capo Bellavista, the coast trends about 13 miles southward to Capo Serracavallo. It consists of rocky and sandy tracts and is generally low and marshy at the sandy stretches and high near the rocky parts. 30

Punta Nera (*Lat.* $39^{\circ} 53' N.$, *Long.* $9^{\circ} 41' E.$) lies about $2\frac{1}{2}$ miles south-south-westward of Torre San Gemiliano, and from its southern extremity Scogli Rossi extend about $1\frac{1}{2}$ cables south-eastward for about $1\frac{1}{2}$ cables. 35

Punta dei Mastixi lies about 4 miles southward of Torre San Gemiliano, and about $1\frac{1}{2}$ miles further southward is Torre di Bari, on a slightly projecting rocky point, *see view facing this page*. From Torre di Bari a sandy beach extends about 5 miles southward. 40

Cala Francese, at the southern end of the sandy beach, is a cove, fringed with rocks, that is only available to boats. Between the cove and Capo Serracavallo, the coast is rocky and should not be approached within 3 cables.

Monte Ferru rises to an elevation of 2,870 feet (875^m) high, about $2\frac{1}{2}$ miles west-north-westward of Capo Serracavallo. 45

Capo Serracavallo, *see view facing this page*, is the extremity of an elevated promontory, formed by a spur of Monte Ferru, at a short distance southward of which is a low, flat, whitish rock, close inshore. From the cape, the coast trends about 10 miles southward, and continues high. It is rocky, reddish and fringed with rocks extending a short distance offshore. 50

Torre di San Giovanni di Saralà, white, cylindrical, and 66 feet (20^m) high, stands near the coast about 3 miles southward of Capo

Chart 161a.

Sferracavallo. About 5 miles westward of this tower, Monte Tacchiseddu rises to an elevation of 2,365 feet (720^m8).

Capo Palmeri, about 4 miles southward of Torre di San Giovanni di Saralà, is the most salient point on this almost straight stretch of coast.

Torre Murtas, red and circular, is taller than Torre di San Giovanni di Saralà and stands at an elevation of 220 feet (67^m1), about 3 miles southward of Capo Palmeri, and near it are some coves available only to boats; some reddish rocks show up eastward of this tower.

From Torre Murtas, a bay with a white sandy beach extends about 3½ miles southward to Capo San Lorenzo, and from its shore a wooded plain extends inland to the foot of Monte Cardiga, which rises to an elevation of 2,218 feet (676^m0) about 7 miles westward of Torre Murtas.

Off-lying islet.—Scoglio di Quirra (Isola di Chirra), 39 feet (11^m9) high, is surrounded by other smaller rocks of about the same elevation. It lies near the middle of the above-mentioned bay, one mile offshore, and about 1½ miles south-south-eastward of Torre Murtas. Approaching from north-north-eastward, it appears reddish with a whitish top. The group is situated at the western end of a shoal which extends about half a mile eastward from it, and has a depth of 2 fathoms (3^m7) over its extremity. There is a navigable passage between the group and the coast, but local knowledge is required.

Anchorage.—Off Porto Frailis, anchorage, sheltered from north-westerly winds, can be obtained, in a depth of 11 fathoms (20^m1), about 2½ cables south-eastward of Torre San Gemiliano.

Anchorage, with offshore winds, can be obtained in the bay in which lies Scoglio di Quirra, the best berth being southward of the islet, near Capo San Lorenzo, but local knowledge is necessary.

Coast.—**Dangers.**—**Light.**—Capo San Lorenzo is dark, rocky and 604 feet (184^m1) high; it may be identified by a tower on its summit. From the cape, the coast trends about 3 miles southward and is backed, at a short distance inland, by a chain of hills with flattened conical summits. This stretch of coast is fringed with shoals, and should be given a berth of at least half a mile.

Torre Motta (Monte Rosso) stands at an elevation of 433 feet (132^m0) about 2 miles southward of Capo San Lorenzo, and southward of it the coastal hills decrease in elevation.

Torre di Porto Corallo, white, circular and 52 feet (15^m8) high, stands on a low, rocky point about one mile southward of Torre Motta (*Lat.* 39° 28' N., *Long.* 9° 39' E.).

Fiume Flumendosa flows into the sea about three-quarters of a mile southward of Torre di Porto Corallo.

Muravera is a village about 2½ miles west-south-westward of the mouth of Fiume Flumendosa, the landing place for which is Porto Corallo.

Porto Corallo is situated on the shore of Cala di Porto Corallo close north-eastward of Torre Porto di Corallo.

The coast between the mouth of Fiume Flumendosa and Capo Ferrato, about 7½ miles southward, is low, sandy, uninhabited, and backed by saltwater lagoons; it is fringed with shoals, and should not be approached within half a mile.

Torre Dieci Cavalli is reddish, shaped like a truncated pyramid and somewhat dismantled. Torre Saline, square and standing on a rocky point, 92 feet (28^m0) high, are, respectively, about 3 and 4½ miles

Chart 161a.

southward of Torre Porto di Corallo. These two towers are difficult to identify as they are the same colour as the coast.

Capo Ferrato is a steep whitish point which projects about $1\frac{1}{2}$ miles from the general line of the coast. About $1\frac{1}{4}$ miles inland of it is Monte Ferru, conical and 981 feet (299^m0) high, with a tower on its summit, see view facing page 257.

A light is exhibited, at an elevation of 149 feet (45^m4), from a white square masonry tower, 16 feet (4^m9) in height, situated on Capo Ferrato (*Lat. 39° 18' N., Long. 9° 38' E.*). 10

Monte dei Sette Fratelli, on the flattened summit of which are seven not very conspicuous peaks, rises to an elevation of 3,356 feet (1,022^m9) about 9 miles westward of Capo Ferrato, and is a good distant landmark, see views facing pages 257 and 260.

Charts 3921, 161a.

From Capo Ferrato the coast trends about 7 miles southward to Punta dei Cappuccini, and is low, sandy, and interrupted by a few rocky points.

Chart 3921.

Scoglio di Sant' Elmo is just above water, and lies 3 cables offshore, about $1\frac{1}{2}$ miles northward of Punta dei Cappuccini. It is steep-to all round, but there is a 6-foot (1^m8) rocky patch about one-quarter of a mile northward of it. Monte Turun, a rocky promontory, 184 feet (56^m1) high, lies about $1\frac{1}{2}$ miles north-north-westward of Punta dei Cappuccini, and about one mile further north-westward Monte Cannas rises to an elevation of 863 feet (263^m0). 25

Punta dei Cappuccini rises steeply from the sea, is rocky, and free from off-lying dangers.

Torre di Cala Pira is 59 feet (18^m0) high and circular. It stands on the eastern entrance point of Cala Pira; the point is closely fringed with rocks, and is situated about three-quarters of a mile southward of Punta dei Cappuccini. The cove has a sandy beach, and is open south-eastward. 30

Punta dei Molenti, the extremity of a small promontory, 23 feet (7^m0) high, lies about $2\frac{1}{2}$ miles southward of Torre di Cala Pira, and the coast between is rocky and of no great elevation. About one mile northward of the point lies Punta Porcelli, a sandy projection within 2 cables south-eastward of which lie Scogli Porcelli. Some rocks lie close south-westward of Punta dei Molenti. 35

Porto Giunco is entered between Punta Molenti and Capo Carbonara, see page 219, about $2\frac{1}{4}$ miles south-south-westward; its shore consists of sandy beaches, separated by salient points, on the largest of which latter, about one mile northward of the cape, stands Torre Giunco at an elevation of 210 feet (64^m0). Close southward of the tower is a short landing pier. 40

Scoglio Sant' Elmo is an above-water rock, about 3 cables north-eastward of Capo Carbonara, with an 8-foot (2^m4) shoal about half a cable southward of it, and an 8-foot (2^m4) rocky patch about $2\frac{1}{2}$ cables north-north-westward of it. 45

Submarine cable.—A submarine cable is landed about midway between Torre Giunco and Capo Carbonara. Anchoring and fishing in its vicinity are prohibited. See page 19.

Off-lying islet and dangers.—**Light.**—Isola Serpentara, near the northern end of which, at an elevation of 177 feet (53^m9), stands Torre

Chart 3921.

di San Luigi, lies about 2 miles east-north-eastward of Punta dei Molenti. From its northern end a shoal bank on which lie some above-water rocks extends about 4 cables northward. The channel inshore
5 of the islet is free from dangers.

Secca dei Berni lies about $1\frac{1}{2}$ miles south-south-westward of Punta dei Molenti.

A light is exhibited, at an elevation of 39 feet (11^m0), from a circular masonry tower, painted black and red in horizontal bands, surmounted
10 by a framework structure and 36 feet (11^m0) in height, situated on Secca dei Berni (*Lat.* $39^\circ 07' N.$, *Long.* $9^\circ 34' E.$).

Anchoragees.—Open anchorage can be obtained, about midway between Scoglio di Sant' Elmo and Punta dei Cappuccini, in a depth of about 11 fathoms (20^m1).

15 Anchorage can be obtained about three-quarters of a mile south-south-eastward of Torre di Cala Pira, but a rocky shoal with a depth of 36 feet (11^m0) lies about 4 cables south-eastward of the tower.

Anchorage can be obtained, in depths of 14 or 15 fathoms (25^m6 or 27^m4), sand, about midway between Punta dei Molenti and the largest
20 above-water rock northward of Isola Serpentara.

Anchorage can be obtained in Porto Giunco, in a depth of 9 or 10 fathoms (16^m5 or 18^m3), sand and weed, with Torre Giunco bearing 245° and the light-structure on Secca dei Berni bearing 114° ; but it
25 winds. should be quitted on any indication of north-easterly or south-easterly

Charts 161a, 676, 165, 2158a.

Summit, bearing
315°, 21½ miles.



*Isola dei
Casoli
lighthouse.*

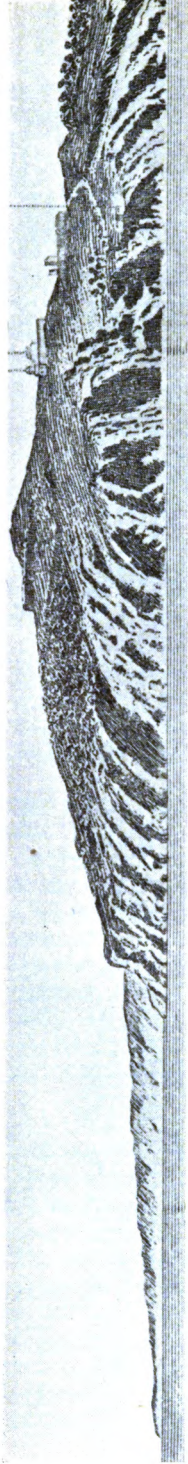
*Torre
Giunco.*

*Monte
Marius.*

*Torre di
San Luigi.
Isola Serpentara.*

Monte dei Sette Fratelli from south-eastward.
(Original dated 1883.)

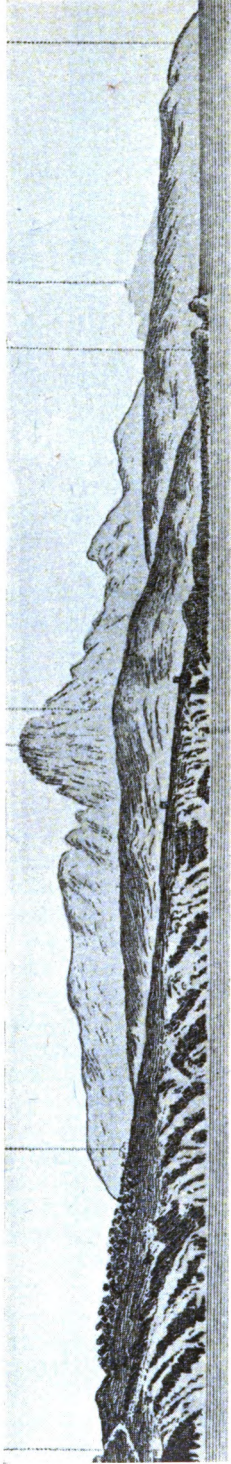
Fog signal
station. *a*



*Punta Almina lighthouse, a
bearing 234°, 1½ miles.*

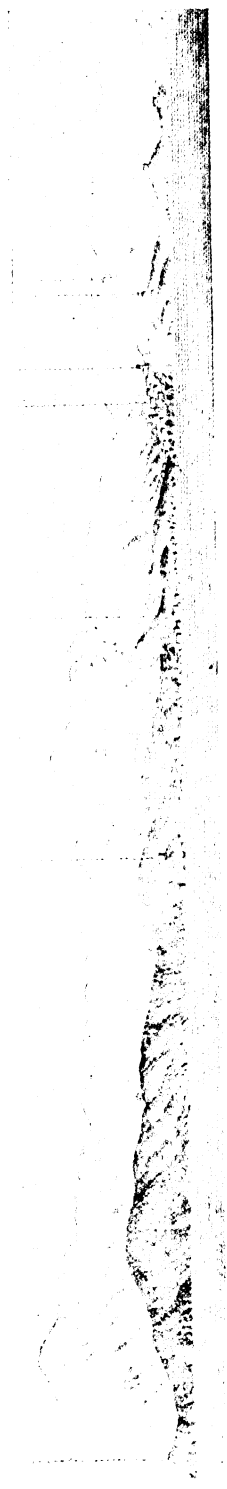
*San Antonio
Monastery.*

Sierra Bullones.



View, in two parts, of Peninsula de Almina from north-eastward.
(Original dated 1924.)

*Punta de
Santa Catalina.*



Cabo Mazari. a

Monte Teisfor.

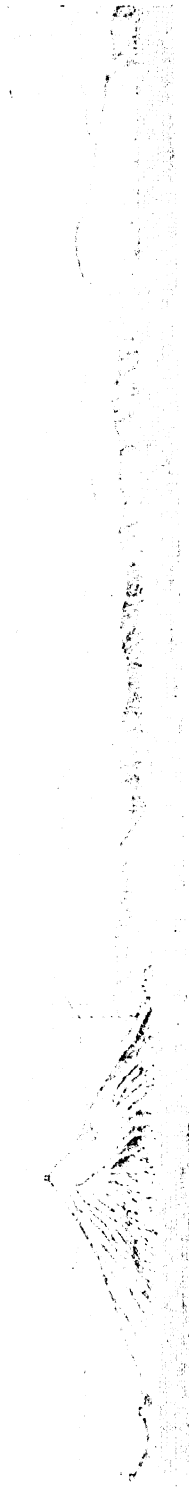
Rio Marín.

Tetuan.

Casa de Quiri.

a

b



a

Cabo Negro tower, bearing 245°, 3½ miles.

Rincon de Madik.

Monte Zem-Zem.

b

Fort Negron.

b

Sierra Bullones.



b

Punta Restinca.

Barracks.

Ceila.

Punta Almira lighthouse

View, in three parts, of the coast southward of Peninsula de Almira.
(Original dated 1883.)

CHAPTER VII

THE COAST OF AFRICA—CEUTA TO ALGIERS

Chart 2717.

COAST OF MOROCCO.—General remarks.—For a description of Ceuta, and the northern coast of Morocco westward of it, *see* West Coasts of Spain and Portugal Pilot.

The coast of Morocco, southward and eastward of Ceuta, is backed by high mountains, from which, in many places, spurs descend to the sea.

The western part forms the coast of the Province of Tetuan, and the eastern part, that of Riff; the two parts differ considerably, for in the western one the slopes of the lofty mountains are well watered, wooded, and cultivated, whereas the coast of Riff is mostly deserted and arid.

The whole coast is exposed to the northerly gales of winter, and in it are no sheltered harbours. There are few off-lying dangers, and in most places the coast can be approached in safety to a short distance.

The principal river is the Muluya, which flows into the Mediterranean about 7 miles from the eastern boundary of Riff, and westward of this river the coast consists of a series of small valleys. The coast of Tetuan is better watered, for numerous streams flow down from the mountains.

Caution.—With the exception of the stretch of coast between Punta Almina and Cabo Mazari, and that between Cabo Tres Forcas and the mouth of Rio Muluya, the coast of Spanish Morocco is practically unsurveyed. Vessels are cautioned not to approach it without special precautions.

Chart 2742.

Peninsula de Almina.—Dangers.—Light.—Fog signal.—This peninsula, on the southern side of the eastern end of the Strait of Gibraltar, is joined to the mainland by a low isthmus, on which stands the town of Ceuta. The seaward sides of the peninsula are very steep, and in most places cliffy. The peninsula itself is hilly; in its centre, Monte Hacho rises to an elevation of 669 feet (203^m9), and is surmounted by a fortress, the walls of which completely encircle its summit. The monastery of San Antonio, on the northern slope of Monte Hacho, is visible from seaward. *See* view facing page 260.

Punta de Santa Catalina (*Lat.* 35° 54' N., *Long.* 5° 17' W.), the northern extremity of the peninsula, is comparatively low, and within

Charts 142, 3578, 773, 92, 2717, 2158a.

Chart 2742.

1½ cables northward of it are some islets, the western and most prominent of which is El Ileo. On one of the other islets are the ruins of a fort with the remains of a causeway between it and the point. There is no
5 passage between the islets and the peninsula.

Bajo Isabel, with a depth of 14 feet (4^m3), lies on a spit, which, with depths of less than 36 feet (11^m0), extends about 2 cables northward of El Ileo. Heavy tide-rips are formed over this shoal.

Punta Almina, the eastern extremity of the peninsula, lies about 10 half a mile south-eastward of Punta de Santa Catalina. It is a steep point, on the slopes of which stands a redoubt.

A light is exhibited, at an elevation of 486 feet (148^m1), from a white circular tower, 52 feet (15^m8) in height, situated about 2 cables south-westward of Punta Almina. See view facing page 264.

15 A fog signal is sounded, at an elevation of 187 feet (57^m0), from a building on Punta Almina.

Laja de la Sirena, with a depth of 13 feet (4^m1), lies within one cable north-eastward of Punta Almina (*Lat.* 35° 54' N., *Long.* 5° 17' W.).

Punta des Desnarigado, about 4 cables southward of Punta Almina,
20 is the south-eastern extremity of the peninsula, and close off it lies Laja de la Corriente, with a least depth of 5 feet (1^m5). From Punta des Desnarigado, cliffs extend about 8 cables west-south-westward to Cala Sachal, at the head of which there is a small fort near a large barracks.

25 **Ensenada de la Almadraba.—Light.**—This bay lies on the southern side of the isthmus on which stands the town of Ceuta, and Punta de Piedras Gordas, its low western entrance point, lies about 1½ miles west-south-westward of Cala Sachal. A bank, with depths
30 of less than 18 feet (5^m5), fringes the shores of this bay, extending as much as 1½ cables offshore. At the head of the bay stands El Boquete.

A light is exhibited, at an elevation of 12 feet (3^m7), from a metal column on a concrete base, situated on the head of the mole at El Boquete.

35 El Pineo, 13 feet (4^m0) high and about 1½ cables south-south-westward of Punta de Piedras Gordas, is the outermost of several large rocks which fringe this point; there is a detached 2-foot (0^m6) patch between it and the rocks nearest to it.

Anchorage.—Caution.—Anchorage, sheltered from westerly and
40 northerly winds, can be obtained in Ensenada de la Almadraba, in depths of 8 fathoms (14^m6), or more.

Tunny nets, see page 27, are laid about half a mile east-north-eastward of El Pineo.

Chart 142.

45 **Coast.—Danger.**—From Punta de Piedras Gordas, the coast trends about 11½ miles southward to Cabo Negro. It is backed by a chain of mountains, which extends southward from Sierra Bullones, see West Coasts of Spain and Portugal Pilot, and from this chain an easterly spur descends to the cape. The lower slopes of these mountains are
50 covered with vegetation. See views facing pages 261 and 264.

Punta del Canto is a low, reddish, rocky point, situated about 1½ miles south-south-westward of Punta de Piedras Gordas, and from it a shoal spit, on which lie Piedras del Canto with depths of 6 feet (1^m8), extends about half a mile eastward.

Charts 3578, 773, 92, 2717, 2158a.

Chart 142.

Arroyo de las Bombas flows into the bay between Punta de Piedras Gordas and Punta del Canto, and in this bay is a wooden landing place.

Ensenada de Castillejos is entered on the southern side of Punta del Canto, and on its shore is a settlement, in which is a factory with 5 conspicuous chimneys (*Lat.* $35^{\circ} 51' N.$, *Long.* $5^{\circ} 21' W.$).

La Condesa is a hillock, 50 feet (15^m2) high, on the coast about one mile southward of Punta del Canto, and on it are the white buildings of a military post; much more noticeable are some large barracks, at an altitude of 1,033 feet (314^m9), about half a mile southward of La 10 Condesa; these barracks are usually brilliantly illuminated at night.

Laja del Caballo, which dries about 2 feet (0^m6), lies 3 cables offshore, about one mile southward of Punta del Canto; the coast in its vicinity is fringed with above-water rocks.

Piedra Blanca, with a depth of 7 feet (2^m1), lies 3 cables offshore 15 about $2\frac{1}{4}$ miles southward of Punta del Canto, and in calm weather is easily distinguished by the light green colour of the water over it.

Punta Restinga is a small projection, about 50 feet (15^m2) high and fringed by rocky shoals extending as much as $2\frac{3}{4}$ cables offshore, situated about $4\frac{1}{2}$ miles southward of Punta del Canto. On the point 20 stands a prominent group of white military buildings.

From Punta Restinga the coast trends about $5\frac{1}{2}$ miles southward and thence about 2 miles eastward, forming a bay, at the head of which stands the village of Rincón del Medik. This village is dominated by a high, reddish church and on the slope of the hill southward of 25 the village there is an Arab cemetery.

Monte Zem-Zem or Verde rises to an elevation of 1,427 feet (434^m9), about 2 miles south-westward of Punta Restinga. Fortín Negron, similar to, but smaller than the fort on Monte Hacho, stands on the northern foothills of Monte Zem-Zem about three-quarters of a mile 30 westward of Punta Restinga.

Anchorage.—Caution.—Open anchorage can be obtained anywhere off the coast between Punta de Piedras Gordas and Cabo Negro in depths of from 11 to 14 fathoms (20^m1 to 25^m6), but care should be taken to ascertain the nature of the bottom, before letting go the 35 anchor, as it is rocky in places. Good anchorage was obtained by H.M.S. *Mutine*, in a depth of 17 fathoms (31^m1), sand and gravel, with Fortín Negron bearing 224° , distant $2\frac{1}{4}$ miles; in 19 fathoms (34^m7), sand and gravel, with the tower on Cabo Negro, *see* page 264, bearing 144° , distant $2\frac{3}{4}$ miles; and in 12 fathoms (3^m7), sand and shells, with 40 a conspicuous reddish-coloured hill, 424 feet (129^m2) high and having a grove of trees near its summit, about 4 miles west-north-westward of Cabo Negro, bearing 272° , distant $2\frac{1}{2}$ miles.

With winds from south-west to north-west, if not too strong, anchorage can be obtained, in depths of from 9 to 11 fathoms (16^m5 to 20^m1), 45 sand, with Punta del Canto bearing between 305° and 330° , distant one mile.

Anchorage, sheltered from southerly and south-south-easterly winds, but exposed to those from northward, can be obtained off Rincón de Medik, in depths of from $5\frac{1}{2}$ to 12 fathoms (10^m1 to 21^m9), sand, at 50 about half a mile offshore.

Tunny nets, *see* page 27, are laid in the vicinity of Punta Restinga.

Chart 183.

Ensenada de Tetuan.—Lights.—Buoy.—This bay, *see* views

Charts 3578, 773, 92, 2717, 2158a.

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Chart 183.

facing page 261 and this page, is entered between Cabo Negro and Punta de Adélau, about $10\frac{1}{2}$ miles south-south-eastward.

Cabo Negro is faced with cliffs, and is surmounted by a hill, 404 feet (123^m1) high, on which is a conspicuous white octagonal tower, surrounded by shrubs. At the foot of the cliffs are several rocks, and close off the northern side of the cape is Islote Palomas, 20 feet (6^m1) high. The cape is dominated by Monte Tayfor or Pan de Azúcar, a dark-coloured, conical hill, which rises to an elevation of 1,093 feet (333^m1), about $1\frac{1}{2}$ miles west-south-westward of it.

The shore at the head of Ensenada de Tetuan is a low beach, fringed by a bank, which, with depths of less than 18 feet (5^m5), extends as much as one-quarter of a mile offshore. It is backed by sandhills, and rises gently to the foothills of the mountains. Urania rock, with a depth of $3\frac{3}{4}$ fathoms (6^m9), is one of the shoal patches within the 5-fathom (9^m1) line, and lies about $3\frac{1}{2}$ cables offshore, $1\frac{1}{2}$ miles southward of the mouth of Rio Martin, *see* below.

About $1\frac{1}{2}$ miles south-south-westward of Cabo Negro lies Ensenada de San Simon, where there is a landing place.

Casa del Quiri, a conspicuous white farmhouse, surmounts a hill, 138 feet (42^m0) high, about 4 cables inland, $2\frac{1}{2}$ miles southward of Cabo Negro (*Lat.* 35° 39' N., *Long.* 5° 17' W.).

Rio Martin flows into the bay about 2 miles southward of Casa del Quiri. The village of Rio Martin stands on the northern side of the river's mouth; northward of the village there is a prominent windmill. The river can be ascended by boats for about $2\frac{1}{2}$ miles, but there is a shifting sandbank off its mouth.

A light is exhibited, at an elevation of 57 feet (17^m4), from the highest of four white towers, 43 feet (13^m1) in height, situated at the corners of the old square fort in the village of Rio Martin.

Two lights are exhibited, each, at an elevation of 15 feet (4^m6), from a wooden post on the northern and southern side, respectively, of the entrance to the river.

Leading lights, with sectors marking the best water in the mouth of the river, are exhibited within the entrance. The front light is exhibited, at an elevation of 36 feet (11^m0), from a disc suspended on cables between two posts, situated, one at the north-western corner of the landing place on the mole, and the other near the south-western corner of the customs house; and the rear light, at an elevation of 49 feet (14^m9), from a disc on a wooden post about 115 feet (35^m1) distant from the front light. The leading line lies in the *white* sectors of these lights, these sectors being coincident; the right and left banks of the river entering are covered by the *green* and *red* sectors of the lights, respectively.

When there is a permanent decrease in the depths in the river mouth the rear light and its disc are altered to *blue* in colour, and a vessel must navigate with caution.

A mooring buoy lies off the entrance to Rio Martin.

The town of Tetuan stands, at an elevation of 200 feet (61^m0), about 6 miles west-south-westward of the mouth of Rio Martin, *see* chart 3578. It is the principal native town in Spanish Morocco, and its white buildings and tall minarets are visible from seaward. A British Consular officer resides in the town. Provisions can be procured.

Cabo Mazari is situated, at the southern end of the beach at the head

Charts 3578, 2717 2158a.



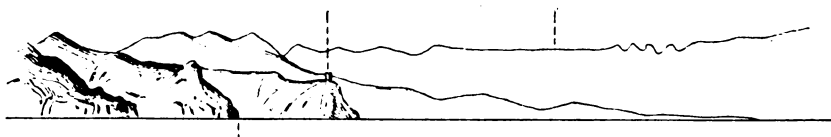
Punta Almina lighthouse.
(Original dated 1944.)



Islas Chafarinas lighthouse.
(Original dated 1899.)



Cabo Negro,
bearing 315°. *Sierra Bullones.*
Cabo Negro from south-eastward.



Punta
Caverna. *Cabo Mazari,*
bearing about 280°. *Cabo Mazari from eastward.*



Yebel Quelti,
bearing 252°. *Uad Lau.*
Monte Anna Quelti from east-north-eastward.
(Originals dated 1899.)



Village,
bearing 217°.

Ras el Targa.

Targa from north-eastward.



Punta Ali.

Fragaza.

Shrine,
bearing
205°.

Ensenada de Tiguizas from north-north-eastward.



Monte de la Sierra.

Yebel Zegsan,
bearing 202°.

Ensenada
de Pescadores.

Yebel Zegsan from north-north-eastward.



Monte de la Sierra.

Yebel Zegsan.

Punta Pescadores,
bearing about 180°.

Ensenada de
Pescadores.

Monte de la Sierra from northward.

(Originals dated 1899.)

Chart 183.

of Ensenada de Tetuan, about $4\frac{1}{2}$ miles south-south-eastward of the mouth of Rio Martin. See view facing page 264.

Ensenada de Mazari, at the mouth of a fertile valley, is entered between Cabo Mazari and Punta de la Caverna (*Lat.* $35^{\circ} 33' N.$, *Long.* $5^{\circ} 13' W.$), a cliffy point about $1\frac{1}{2}$ miles east-south-eastward.

Punta de Adelau, or Ras Mencad, lies about $1\frac{1}{2}$ miles east-south-eastward of Punta de la Caverna, and its northern side is faced with cliffs. Between the two points is a cove with a fertile valley at its head.

Anchorages.—Caution.—Ensenada de Tetuan affords anchorage, 10 sheltered from winds between south-east and north-west, but care must be taken to select a sandy spot, for the bottom is rocky in places ; see also page 24.

Vessels are cautioned against anchoring near the submarine cable, see page 19, the route of which is indicated by a wavy line on the 15 chart. In addition to the cable thus shown, two others are landed at the cable hut from north-easterly and easterly directions, respectively.

A good berth, when it is desired to communicate with Rio Martin, is, in depths of 11 fathoms (20^m1), sand, with the light-structure in the village of Rio Martin bearing 345° and Cabo Mazari, bearing 163° , or 20 closer inshore, in depths of 8 to 10 fathoms (14^m6 to 18^m3), sand.

Anchorage can be obtained off Ensenada de Mazari in depths of from 7 to 8 fathoms (12^m8 to 14^m6), sand ; but onshore winds raise a heavy sea.

Tidal streams.—Between Ceuta and Punta de Adelau, the tidal 25 streams do not usually attain any great rate ; on the rising tide they flow north-westward, and on the falling tide they set south-westward. In the offing there is a constant east-going current. Off Cabo Negro, the tidal streams are sometimes strong, and eddies are always formed within one mile of it. 30

Chart 2717.

Coast.—Danger.—From Punta de Adelau, the coast trends about 5 miles south-eastward to Punta Omara. It consists of a series of beaches separated by high, reddish, rocky points, which are not salient. This stretch of coast is backed by mountains, which about 4 miles 35 inland attain elevations of over 3,000 feet (914^m4).

Punta Omara is surmounted by a white circular tower ; it is steep and close off it lies an islet. Close southward of this point stand a white shrine and some other white buildings, which show up well against the green background. 40

Uad Lau flows into the sea through a large valley about 3 miles south-eastward of Punta Omara. Its mouth is in the middle of a white sandy beach, and has a bar which prohibits entry ; on its northern side stands a town. From the southern end of the beach, the coast trends eastward, and, becoming high, has on its slopes a triangular patch of 45 white sand, on one side of which is a deep valley.

Monte Anna Quelti (Jebel Quelti) rises to an elevation of 7,221 feet ($2,201^m0$) about 11 miles south-westward of Punta Omara, and can easily be identified by its isolation, and by its flattened, dark-grey, barren, rocky summit, but during easterly winds it is obscured by 50: clouds. See view facing page 264.

Ras Targa lies close eastward of the triangular sandy patch about $5\frac{1}{2}$ miles south-eastward of Punta Omara, and is surmounted by a white, circular tower. Close off Ras Targa (*Lat.* $35^{\circ} 25' N.$, *Long.*

Charts 3578, 2717, 2158a.

Chart 2717.

5° 01' W.) are several rocks, one of which is prominent and almost large enough to be called an islet.

Banco Cotelte is reported to lie about $1\frac{1}{2}$ miles offshore eastward of Ras Targa, and to have a depth of about 5 feet (1^m5), with depths of from $3\frac{1}{4}$ to $4\frac{1}{2}$ fathoms (6^m4 to 8^m2) between it and the coast. The sea does not appear to break on it, but tide-rips have been reported in the vicinity. This danger has not been examined and this part of the coast should be given a berth of at least 2 or 3 miles.

- 10 Ensenada de Targa, which is entered close eastward of Ras Targa, affords no shelter except under good conditions with south-westerly winds. The village of Targa, which from a distance appears as a red or grey patch, stands in the valley at the head of the bight. On the hills westward of the valley are a number of houses and a shrine. On the south-eastern side of the bight is a hill, surmounted by the ruins of a large fortress and a shrine. See view facing page 265.

The south-eastern entrance point of Ensenada de Targa is steep, but not salient. Close off it are some black rocks, and on its southern side is another stretch of beach off which lies the southern end of Banco Cotelte.

Ras Tiguizas, a reddish, rocky, flat-topped point, is about 5 miles south-eastward of Ras Targa, and on a cliffy projection about $1\frac{1}{2}$ miles north-eastward of it are the ruins of a tower; at a short distance southward of Ras Tiguizas is a conspicuous shrine.

- 25 **Anchorage.—Caution.**—In fine weather, open anchorage can be obtained, by vessels with local knowledge, off the beach southward of Punta Omara; vessels can anchor close inshore for the beach is steep-to. Caution must be exercised, however, to avoid some submarine telegraph cables, which are landed near the mouth of Uad Lau. See pages 19 and 265.

Ensenada de Tiguizas or los Alamos.—This is a slight indentation in the coast between Ras Tiguizas and Punta Ali, about $2\frac{1}{2}$ miles south-south-eastward. It has a sandy beach, behind which is a wooded valley. See view facing page 265.

- 35 The village of Tiguizas stands on the bank of Rio de Tiguizas, which flows into the head of the bay. On a small hill northward of the village stands a shrine.

Torre de Ali (*Lat. 35° 19' N., Long. 4° 56' W.*) is a white, circular tower surmounting a high rocky hill above Punta Ali.

- 40 **Anchorage.**—In fine weather, open anchorage can be obtained, by vessels with local knowledge, off Ensenada de Tiguizas, in a depth of about 22 fathoms (40^m2), sand, about one mile from the beach.

Coast.—Dangers.—From Punta Ali, the coast trends about 4 miles east-south-eastward to Punta Jagerschmidt or Ras Ijnien, and increasing rapidly in elevation, consists of almost inaccessible cliffs rising steeply from the sea. These cliffs are separated by short stretches of beach, and on their northern sides there are some triangular reddish patches.

- Punta Jagerschmidt is a dark, rounded projection, about 4 miles south-westward of which, Monte Jagerschmidt rises to an elevation of 4,363 feet ($1,329^m8$). Close westward of the point lies a small beach flanked by two large black rocks. Two prominent, reddish, rocky islets lie close to the point. A short distance north-westward of the point is a detached $4\frac{1}{2}$ -fathom (7^m8) patch.

Chart 2158a.

Chart 2717.

From Punta Jagerschmidt the coast trends about 8 miles south-eastward, and continues, for the most part, high and cliffy, with rocks at its foot.

Ensenada de M'ter, about 4 miles south-eastward of Punta Jagerschmidt, has a beach at its head, and into it flows Rio M'ter, through a deep, narrow valley.

Ensenada de Sidi Attar is entered about 3 miles south-eastward of Ensenada de M'ter. On its shore is a shrine surrounded by trees and bushes. Between this shrine and another shrine on the summit of a spur of the hills, south-eastward, is the mouth of Rio Tarssa, which is no more than a rivulet. Farther inland a tower surmounts a hill and shows up well against a green background.

Monte Scovasso or Yebel Zegsan rises to an elevation of 4,265 feet (1,300^m0), about 3 miles southward of Ensenada de Sidi Attar, and is a good mark. A notch in its summit is visible when bearing less than 230°. See views facing page 265.

Ensenada de Pescadores.—Light.—Dangers.—This bay is entered on the western side of Punta de Pescadores, about 3 miles south-eastward of Ensenada de Sidi Attar. Its shore is a sandy beach, in which is the mouth of Rio Varenga. This river flows through a deep and narrow valley between Monte Scovasso and Monte de la Sierra, and forms the seaward end of the boundary between the Provinces of Tetuan and Riff.

Monte de la Sierra (*Lat.* 35° 11' N., *Long.* 4° 41' W.) is so named from the serrated appearance of its western part, but it is not very noticeable until Monte Scovasso bears more than 160°. See views facing page 265.

Punta de Pescadores is rocky and salient, and close off it is a rocky islet. In its northern side is a small circular cove, with a narrow entrance, that is available to boats, except in bad weather, when a heavy sea enters. The point, though not so high as the coast in its vicinity, is one of the best landmarks in the neighbourhood, as it is salient, has some reddish patches on its dark cliffs and has on its summit a rock resembling a tower. About 9 miles southward of the point is a mountain, 4,985 feet (1,519^m4) high.

A light is exhibited, at an elevation of 138 feet (42^m1), from a grey lantern on a white hut, 10 feet (3^m0) in height, situated on Punta de Pescadores.

Three rocks, with a least depth of 3 feet (0^m9), lie about half a cable off Punta de Pescadores, on the intersection of two lines indicated, respectively, by the alignment of two red circles and by that of two posts.

Puerto Capaz is a settlement on Punta de Pescadores in which are some brick works and lime kilns, and an electricity generating station. A mole extends from a rocky projection, about 300 feet (91^m4) high, at Puerto Capaz. In 1950, this mole had been half destroyed, and only about 65 feet (19^m8) of it remained undamaged. See page 24.

Anchorage.—In fine weather, anchorage, sheltered from winds between south-east and west-south-west, can be obtained by vessels, with local knowledge, in Ensenada de Pescadores, but fresh breezes send in a heavy swell.

Coast.—Danger.—On the eastern side of Punta de Pescadores there is a sandy beach, whence cliffs, gradually decreasing in height,

Chart 2158a.

Chart 2717.

extend east-south-eastward for about $2\frac{1}{2}$ miles to the low western entrance point of Ensenada de Rocas Negras.

Ensenada de Rocas Negras (*Lat. $35^{\circ} 12' N.$, Long. $4^{\circ} 37' W.$*) is a small bay, the beach of which is foul and has some black rocks on its eastern part. At the head of the bay is a small well-populated valley, in which are some patches of bare red earth.

From Ensenada de Rocas Negras, the coast trends about 4 miles east-south-eastward to Cala Traidores, and is almost straight, of regular height, with large yellow patches showing up against the green background.

Cala Traidores is entered between a clifly point, surmounted by a high hill, and a spur of the mountains farther eastward. At its head is a valley, shut in by mountains, in which is the town of Bab, surrounded by trees and cultivated land.

From Cala Traidores, the coast trends about $4\frac{1}{2}$ miles east-south-eastward to Cala Mestaza, and is bold though lower than that farther westward.

Cala Mestaza (Mostaza) affords no shelter, except from offshore winds, and the bottom is of coarse gravel. Its western entrance point is rocky and, descending in a gentle slope, ends in cliffs surmounted by a white circular tower; this tower, though not so prominent as that at Ensenada de Sidi Attar, *see* page 267, is a useful landmark when coming from westward, for there are no others between them that show up well from seaward. On the shore of the eastern part of the bay are some white houses, surrounded by fields. The bay is backed by an extensive and populated valley, through which flows Rio Mestaza, on the left bank of which stands the town of Mestaza, about 3 miles inland.

A rock, with a depth of less than 6 feet (1^m8), lies 4 cables offshore, about one mile north-eastward of the western entrance point of Cala Mestaza. There is a $4\frac{1}{2}$ -fathom (7^m8) patch close south-westward of this rock.

From the eastern entrance point of Cala Mestaza, the coast trends about 4 miles eastward, to the western entrance point of Ensenada de Iris, and diminishing in elevation is rugged, its narrow beach being fringed with dark rocks with reddish patches.

Ensenada de Iris.—Dangers.—Ras el Borch Lomchat, the western entrance point of this cove, is a white cliff, at the foot of which there are two rocky islets, one sharp-pointed, white and fairly high, the other low and flat. From these islets a reef extends a short distance northward and is usually marked by breakers.

This cove has two beaches at its head, separated by a rocky point from which a reef extends to two white pointed rocks. It is entered between the reef off the western entrance point and Isla Iris. *See* view facing page 270.

Isla Iris, 124 feet (37^m8) high, lies about $1\frac{1}{2}$ cables offshore, and is joined to the mainland by a reef with depths of less than 6 feet (1^m8); it is barren, and on its north-western side are some white vertical cliffs, but it is not easily distinguished from the land behind it.

Two sharp peaks rise to elevations of 5,845 and 4,625 feet ($1,781^m6$ and $1,409^m7$), about $9\frac{1}{2}$ miles, respectively, south-south-westward and south-westward of Isla Iris, the higher one being the more noticeable.

Anchorage.—In fine settled weather, small vessels, with local

Chart 2158a.

Chart 2717.

knowledge, can obtain anchorage in Ensenada de Iris, in depths of from $3\frac{1}{4}$ to 6 fathoms (5^m9 to 11^m0), fine sand, between Isla Iris and the point at the head of the cove, with the vessel's head towards the latter, and a kedge anchor laid out seaward, but as the anchorage is exposed to winds from north-west to north-east it is preferable to anchor on the seaward side of the island. Anchorage, somewhat sheltered from westerly winds, can be obtained, by small vessels with local knowledge, eastward of Isla Iris. 5

Coast.—From abreast Isla Iris, level-topped cliffs trend about $1\frac{1}{2}$ miles east-north-eastward to the western entrance point of Ensenada de Alcalá. 10

Ensenada de Alcalá lies on the eastern side of a small promontory, and has a beach at its head, which is free from dangers. On the shore of this bay stands the town of Torres de Alcalá. The bay is dominated by a mound, 269 feet (82^m0) high, on which stand five towers. Two buoys are laid in the approaches to Ensenada de Alcalá to mark the submarine cables landed there; vessels are cautioned not to anchor in their vicinity, *see* page 19. 15

From Ensenada de Alcalá, the coast trends about 2 miles north-eastward to Peñón de Vélez de la Gomera, and consists of high, vertical cliffs, close to the fort of which are steep-to islets and detached rocks. 20

Vélez de la Gomera.—**Light.**—Peñón de Vélez de la Gomera is a conical rocky island, 282 feet (76^m8) high at its northern end, on which is a fortress, the white buildings of which are noticeable. It is connected by a rocky ridge with an islet, 69 feet (21^m0) high, and is easily identified from westward or northward, but when approaching from eastward it is partially hidden by the land on that side of it. 25

A light is exhibited, at an elevation of 154 feet (46^m9), from a grey tower, 20 feet (6^m1) in height, situated on the north-western extremity of Peñón de Vélez de la Gomera (*Lat. $35^{\circ} 11' N.$, Long. $4^{\circ} 18' W.$*). 30

Cala de la Terrera, south-south-westward of the island, is fairly deep, but its shores are fringed with rocks and reefs.

Ensenada de Vélez de la Gomera is entered between the island and Cabo Baba, about one mile north-eastward, and at its head, in Caletón de Levante, is a beach, about $3\frac{1}{2}$ cables long, between Punta del Caletón, southward of the island, and Punta del Reductillo, eastward of it. Rio de la Vega flows through an extensive plain into the sea close westward of Punta del Reductillo. *See* view facing page 270. 35

The passage between Punta del Caletón and Peñón de Vélez de la Gomera has silted up, and is now impassable. 40

Cabo Baba is a bold, steep, dark headland; on the summit are the ruins of a shrine. It descends from a spur of the mountains, in the crest of which is a break, which appears as a hole when seen from eastward. A west-going current, sometimes attaining a rate of 2 knots, is experienced off the cape. *See* view facing page 270. 45

Anchorage.—**Caution.**—In fine weather, temporary anchorage can be obtained, by vessels of moderate size, between Peñón de Vélez de la Gomera and Cabo Baba, but local knowledge is necessary; the anchorage, moreover, cannot be recommended in winter. 50

Caution must be exercised to avoid the submarine telegraph cables, *see* page 19, which are landed at Peñón de Vélez de la Gomera.

Coast.—**Caution.**—**Light.**—Bajo Quemado, with a depth of about 3 feet (0^m9), lies one cable offshore about $2\frac{1}{2}$ cables eastward of Cabo

Chart 2717.

Baba, and close eastward of it is Islote Quemado, but this islet is not easily distinguished from the land behind it.

Punta Negra, close eastward of Islote Quemado, is the first of a series of high rugged cliffs on which are some whitish patches; many of these cliffs rise vertically from the sea, but here and there are small sandy beaches strewn with black rocks.

Frontón del Remolón (*Lat. 35° 11' N., Long. 4° 15' W.*), the next point eastward of Punta Negra, consists of an almost vertical cliff.

Islotes del Topo lie close off a rocky point, about 4 miles eastward of Cabo Baba, and on the eastern side of the point is a cove, with a beach about one-quarter of a mile long.

Punta Jalu (Julu), about 2 miles north-eastward of Islotes del Topo, is high, rocky, and almost vertical, and off it is an islet.

Casa de los Gitanos is white and surmounts a hill, the spurs of which descend to the sea about $2\frac{1}{2}$ miles eastward of Punta Jalu; about half a mile farther eastward is another white building on the top of a hill.

Monte de Melona rises to an elevation of 1,225 feet (373^m₄) about 5 miles eastward of Punta Jalu, and on its summit is a white shrine; in the vicinity of this mountain there are several white buildings.

From abreast Monte de Melona, the coast trends about 4 miles east-north-eastward to Punta Bocicú (Bosicu), and, decreasing gradually in elevation, presents a continuous wall of vertical rock, without any beach, the high land within it preserving its broken and mountainous character.

Punta Bocicú rises to a conical mountain, on the top of which is a white building, which shows up well, especially from eastward. On the western side of the point is Cala de Bocicú, at the head of which are three small beaches. This cove is only suited to small craft, with local knowledge, during offshore winds. Both entrance points are fringed with black rocks; a stream flows into the cove. On the eastern side of Punta Bocicú is a bay that affords shelter to small vessels with local knowledge.

Punta de los Frailes lies about 5 miles eastward of Punta Bocicú, and the coast between them consists of cliffs of moderate elevation, which gradually decrease in height eastward. Under the point is a reef lying close inshore.

Morro Nuevo light is exhibited, at an elevation of 404 feet (123^m₁), from a grey circular tower with a hemispherical cupola, attached to a dwelling, situated on Punta de los Frailes.

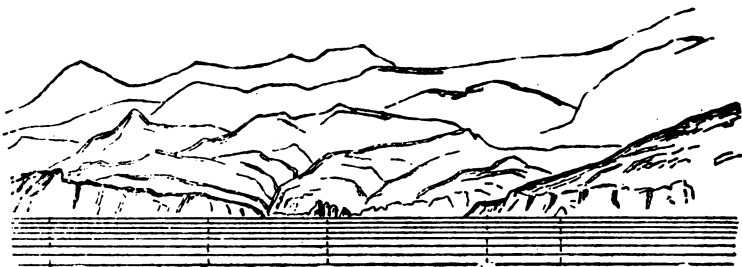
Caution should be exercised when navigating along the foregoing stretch of coast, for both the sea and the current set towards it.

Bahia de Alhucemas. — Life-saving. — Lights. — Light-buoy. — This bay is entered between Cabo Morro Nuevo and Ras Sidi Chaib, the western extremity of Cabo Quilates, about 8 miles eastward. On either side of the bay the land is mountainous, but at the head it is low.

Cabo Morro Nuevo (*Lat. 35° 15' N., Long. 3° 55' W.*) is a high prominent headland, about one mile south-eastward of Punta de los Frailes, and the coast between is cliffy. This headland is composed of inaccessible white and yellow cliffs, on which are patches of ferruginous rock.

Montana de Malmusi rises to an elevation of 1,083 feet (330^m₁)

Chart 2158a.



*Isla de
Iris.*

*Puerto de
Iris.*

*Pointed
rocky isles,
bearing 132°.*

Ensenada de Iris from north-westward.

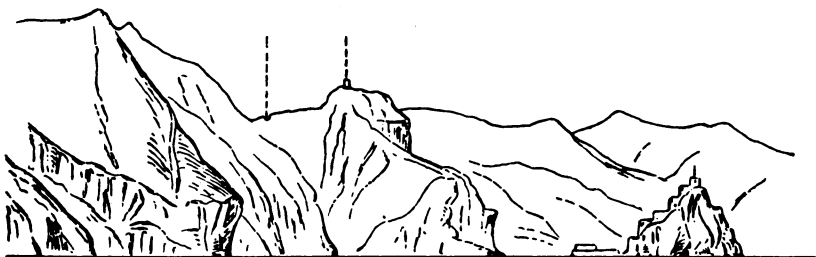


*Cabo
Baba.*

*Peñón de Vélez
de la Gomera.*

*Torres de
Alcalá.*

Peñón de Vélez de la Gomera from northward.



*Fronón
del Remolón.*

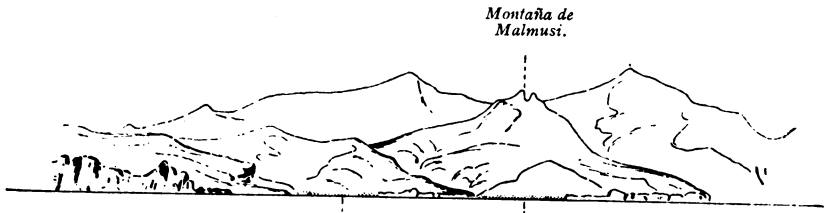
*Punta
Negra.*

*Cabo Baba,
bearing 205°.*

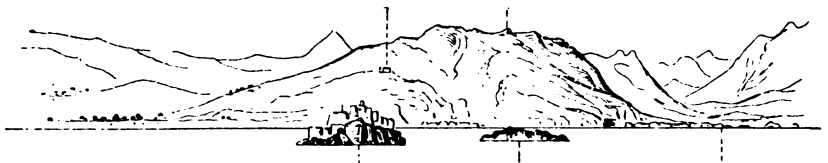
*Peñón de Vélez
de la Gomera.*

Cabo Baba from north-north-eastward.

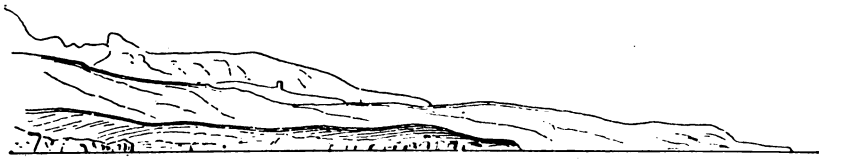
(Originals dated 1899.)



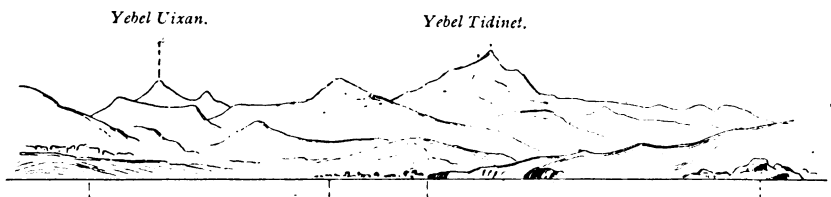
Montaña de Malmusi from northward.



Peñón de Alhucemas from north-eastward.



Cabo Quilates from north-eastward.



Ensenada de Azanen from north-westward.

(Originals dated 1899.)

Chart 2717.

about 2 miles south-westward of Cabo Morro Nuevo. At its summit there is a notch which is visible on most bearings, though to a lesser degree on southerly ones, when a similar notch in a lower hill in front of it may lead to error. *See view facing this page.*

Cala del Quemado is entered between Cabo Morro Nuevo and Morro Viejo, about three-quarters of a mile southward, and in it is Cala de los Islotes, now Puerto de Villa Sanjurjo, in which are three islets. On the western side of Bahía de Alhucemas, southward of Cala del Quemado, are several other coves.

Puerto de Villa Sanjurjo consists of two quays, the eastern of which has depths of 23 feet (7^m0) alongside and can accommodate a vessel 300 feet (91^m4) long; the breakwater protecting these had, in 1950, been destroyed. The harbour is very narrow and vessels drawing more than 16 feet (4^m9) must exercise care. The town had a population of about 10,000 in 1950. A small stock of coal is usually maintained. Minor repairs can be executed. There are three hospitals. A tug is available. The principal exports are esparto grass, ore, wood and sardines.

Leading lights are exhibited, the front light, at an elevation of 82 feet (25^m0), from a small white tower with a red diamond daymark; and the rear light, at an elevation of 155 feet (47^m2), from a similar structure, situated on the shore at Villa Sanjurjo. These lights in line, bearing 274°, lead towards the harbour.

Leading lights are exhibited, the front light, at an elevation of 90 feet (27^m4), from a small white tower with a green diamond daymark; and the rear light, at an elevation of 150 feet (45^m7), from a similar structure, situated on Muelle de Ribera. These lights in line, bearing 330°, lead into the harbour.

These light-structures are reported to be difficult to distinguish except in the morning when the sun shines on their seaward sides.

A light-buoy, exhibiting a *red flashing light every two seconds*, is moored close northward of the outermost of the above-mentioned islets; it marks a flat rock with a depth of 2½ fathoms (5^m0).

Life-saving appliances are maintained at Villa Sanjurjo. *See page 15.*

A pilot is available. Provisions and some water can be procured.

Peñón de Alhucemas (*Lat. 35° 13' N., Long. 3° 53' W.*) lies about 3¼ cables offshore 2½ miles south-south-eastward of Cabo Morro Nuevo. It is 89 feet (27^m1) high at its northern end and on it stands a ruined fortress. About half a mile west-north-westward of this rock are two low, uninhabited islets, Isla de Mar and Isla de Tierra. Close south-eastward of Isla de Mar there is a shoal with a depth of less than 6 feet (1^m8), and close north-westward of Peñón de Alhucemas is a shoal with a depth of 13 feet (4^m0). The depths between Peñón de Alhucemas and the mainland are less than 3 fathoms (5^m5), and the channel is gradually silting up. *See view facing this page.*

At the head of Bahía de Alhucemas there is an extensive beach, in which are the mouths of two streams, and behind it is a large, well-populated, and cultivated plain.

Cabo Quilates is the north-western extremity of a low rounded promontory, the whole of which is known by the name of Cabo Quilates, *see below.* Close south-eastward of the point, on the summit of a hill, and near a group of trees, is a white shrine. *See view facing this page.*

Chart 2158a.

Chart 2717.

Anchorage.—Submarine cables.—Bahia de Alhucemas, though open northward, affords anchorage, to vessels with local knowledge, in fine weather, from one to 2 cables eastward of Peñón de Alhucemas, in a depth of about 6 fathoms (11^m0), good holding ground. Small craft, with local knowledge, can obtain anchorage between the rock and the shore southward of it.

There is anchorage, in depths of 11 fathoms (20^m1), on the line of the outer leading light-structures at Villa Sanjurjo, but with north-easterly winds this anchorage is dangerous.

With north-easterly winds, anchorage can be obtained, by vessels with local knowledge, in depths of about 7 fathoms (12^m8), in the south-eastern corner of the bay, and with south-westerly ones, between Morro Nuevo and Peñón de Alhucemas.

Caution must be exercised to avoid anchoring in the vicinity of the submarine telegraph cables, *see* page 19, one of which is landed in Cala del Quemado, while two others are connected with Peñón de Alhucemas. The first-mentioned is marked by a buoy near Morro Viejo, and the others, by a buoy about 1½ cables northward of the rock. *See* page 24.

The bottom in the bay is in most places sand, but there are patches of gravel and soft mud, and also some rocks, on account of which last the nature of the bottom should be ascertained before letting go the anchor; generally, the greater the depth, the firmer the bottom.

Currents.—Winds.—The currents in the bay are irregular, and are much influenced by the prevailing wind; at times they attain a rate of one knot, but the constant west-going counter-current, *see* page 7, will be found northward of the line joining the entrance points. Eddies and ripples are experienced off both these points.

Offshore winds seldom blow; when they do they begin about 2300 or 0000, and continue until 0800 or 0900, when they are succeeded by the sea breeze.

Coast.—Light.—Punta de Babazún lies about 2 miles eastward of Ras Sidi Chaib, and is the north-eastern extremity of Cabo Quilates which descends in gentle slopes from a range, 1,453 feet (442^m9) in height, running northward and southward on the eastern side of Bahia de Alhucemas. The northern side of this promontory is slightly indented, and in one of the coves thus formed is a beach of dark coloured sand, with a black pinnacle rock at its western end.

A light is exhibited, at an elevation of 262 feet (79^m9), from a white octagonal three-storied tower, 118 feet (36^m0) in height, situated on Punta de Babazún (*Lat.* 35° 16' N., *Long.* 3° 43' W.).

From Punta de Babazún, the coast trends south-eastward, and, becoming higher, is backed by high mountains in the interior.

Ras Tasemsalt (Tosensuch), about 4 miles south-eastward of Punta de Babazún, can be identified by its cliffs, which rise steeply from the sea, and have at their foot several black rocks, and a yellow patch, in which is the mouth of a deep cavern. The coast between the cape and the point is almost straight, and in it are several beaches.

From Ras Tasemsalt, the coast trends east-south-eastward, and consists of an extensive sandy beach, backed by dark-coloured hills, which slope steeply to the sea.

Sidi Dris is a conspicuous white shrine, which can be distinguished from several settlements and other shrines on this coast, for it is isolated

Chart 2158a.

Chart 2717.

and stands on the summit of a coastal hill. Rio Bu Azzún flows into the sea, through a fertile valley, close eastward of Sidi Dris.

Ras Afrau lies about 5 miles eastward of Sidi Dris, and between them are several sandy beaches. The point is moderately high, and is the clifly termination of a spur of the mountains, which in this neighbourhood approach within a few miles of the coast. On the eastern side of the point is a place for loading mineral ore.

The loading place, off which there are several mooring buoys, can be identified by a house, the only one in the vicinity, about 2 miles westward of it. At night, until 2200, a light is exhibited from the house when a vessel is expected.

There is anchorage, in a depth of 9 fathoms (16^m5), sand and gravel, with the house bearing 220° , distant $1\frac{1}{2}$ miles.

A shoal bank extends about 3 cables from Ras Afrau.

Monte Barcaitzegui (Barcaitzeguy), the most prominent of the mountains, rises to an elevation of 2,822 feet (860^m1), about 4 miles southward of Ras Afrau, and about $2\frac{1}{2}$ miles south-westward of it, Yebel Azrú rises to an elevation of 3,740 feet ($1,139^m9$).

Marsa Sidi el Hassain is a cove, on the eastern side of Ras Afrau, with a sandy beach at its head, in which is the mouth of a stream. On a hillock, near the beach, is a shrine, close eastward of which, on the summit of the cliffs, is a white wall, near a large village.

Eastward of Marsa Sidi el Hassain, the coast changes its character, and the cliffs, of a dark red colour, exhibit numerous flaws, and are backed by high and rugged mountains; the stretches of beach become few and far between, the only one of any size being at La Caleta, about 8 miles eastward of the cove.

Roca del Léon (*Lat. $35^\circ 13' N.$, Long. $3^\circ 16' W.$*) lies close inshore, at the foot of the cliffs, about $2\frac{1}{2}$ miles eastward of La Caleta, and from certain directions has some resemblance to a lion.

Punta Betoya, about $1\frac{1}{2}$ miles east-north-eastward of Roca del Léon, slopes steeply to the sea at the eastern end of the coastal mountains, and the coast between the rock and the point is rocky. The point ends in low cliffs, and on a hill above it is a white shrine surrounded by dark-coloured buildings.

Ensenada de Azanen.—Dangers.—This bay is entered between Punta Betoya and Punta Garet, about 4 miles north-eastward, and has a sandy beach, through which Rio Gueret or Kert flows into the sea; inland of the beach is an extensive, well-cultivated plain. The eastern part of the shore is backed by low dunes of very white sand, the only ones along this stretch of coast. The town of Azanen is situated near the mouth of Rio Gueret. *See view facing page 271.*

Inland of the bay there are mountain ranges in which the most prominent peaks are Yebel Mauro, 2,185 feet (666^m0) high, about 4 miles south-south-westward; Yebel Tumiat, 902 feet (274^m9) high, about 3 miles south-eastward; Yebel Tidinit, isolated, conical and 2,743 feet (836^m1) high, about 7 miles south-eastward; and Yebel Uixan, 2,743 feet (836^m1) high, about 11 miles south-eastward of Punta Betoya.

Punta Garet is sandy and not easy to identify. The depths off the point are uneven, and about $2\frac{1}{2}$ miles north-eastward of the point there is a detached $2\frac{1}{2}$ -fathom (4^m6) patch, which has not been examined.

Anchorage.—Ensenada de Azanen is open from west, through

Chart 2158a.

Chart 2717.

north, to north-east, but with offshore winds it affords anchorage, in depths of 8 or 9 fathoms (14^m6 or 16^m5), mostly sand. When approaching the bay, care must be taken to avoid the shoals off Punta Garet, and a vessel not in possession of local knowledge should not cross an imaginary line joining Punta Betoya and Punta Garet, except in the vicinity of the former, whence she should steer for the mouth of Rio Gueret and, sounding continuously, anchor according to draught.

Chart 2437.

10 **Coast.—Dangers.—Light.**—Punta Negri lies about one mile north-north-eastward of Punta Garet, *see* chart 2717, and is easily identified for it is higher than the land in its vicinity, and is faced with black vertical cliffs; moreover, on account of its straight and uniform appearance it seems artificial.

15 Cala de Cazaza lies eastward of Punta Negri, and its shores consist of a succession of rocky points; in one corner of the cove is a white shrine. In the middle of the cove, about 1½ cables northward of the extremity of a headland close westward of the shrine, is a small detached shoal, with a depth of less than 2 feet (0^m6), and the shores of the cove
20 are reported to be fringed with sunken rocks, the positions of which have not been determined.

From the head of Cala de Cazaza, the coast trends about 12 miles north-north-eastward to Cabo Viejo, and is high and very rugged. There are no beaches, and at the foot of the cliffs there are numerous
25 detached rocks.

Isla Charranes (*Lat. 35° 24' N., Long. 3° 02' W.*), the most noticeable of the above-mentioned rocks, lies close off Punta Rua Fiff, about 9½ miles north-eastward of Punta Negri, and between it and the southern entrance point of Cala Tramontana, close northward of it, is the
30 entrance of a cove, at the head of which is a zig-zag road, which shows up well from westward or south-westward.

Cala Tramontana is entered between the last-mentioned point and Ras Baraket, close northward of it, and on either point is a conspicuous conical hill, both of about the same height, that on the southern point
35 being the more remarkable of the two; on the southern side of the cove is a prominent sandhill, which is a spur of the conical hill on that side. At the head of the cove are two beaches, separated by a white cliff; on the northern beach, close to the end of the cliff, is a white rock.

A light is exhibited, at an elevation of 160 feet (48^m8), from a circular
40 masonry tower, 13 feet (4^m0) in height, situated on Ras Baraket.

From Ras Baraket, the rugged and indented coast trends about 2½ miles northward to Cabo Viejo.

Anchorage.—Only small vessels with local knowledge can enter Cala Tramontana or the cove southward of it.

45 In fine weather, or with easterly winds, good anchorage can be obtained, by vessels with local knowledge, south-westward of Isla Charranes, in depths of 10 or 11 fathoms (18^m3 or 20^m1).

Cabo Tres Forcas.—Dangers.—Lights.—Fog signals.—Cabo Tres Forcas is the northern extremity of a very prominent and salient
50 promontory, which terminates in several points, three of which are more pronounced than the others. Easterly winds raise a heavy sea off this promontory, for which reason it should be given a wide berth.

Cabo Viejo, the westernmost and most salient of the three principal points, has a black conical rock close off it and about 3 cables east-

Chart 2158a.

Chart 2437.

north-eastward of it is a rocky shoal, with a depth of less than 6 feet (1^m8), on which the sea breaks with easterly or strong westerly winds. A rock, with a depth of one foot (0^m3), lies about three-quarters of a mile east-north-eastward of Cabo Viejo. *See view facing page 278.* 5

Punta del Tio Pinar is the next point eastward of Cabo Viejo, and between them is a cove surrounded by high cliffs, one of which is yellow in colour and has three caves at its foot; at the head of the cove is a beach.

A rock, with a depth of one foot (0^m3), was reported by H.M.S. 10 *Stork*, in 1895, to lie about 2½ cables northward of Punta del Pinar.

Punta de Cabo Nuevo, or de los Dos Tejas, is the point next eastward of Punta del Tio Pinar, and between them is a cove with rugged shores and no beach.

Cabo Tres Forcas light (*Lat. 35° 27' N., Long. 2° 59' E.*) is exhibited, 15 at an elevation of 367 feet (111^m8), from a square tower surmounting a rectangular, two-storied building, painted light grey and 59 feet (18^m2) in height, situated on Punta de Cabo Nuevo. A fog signal is sounded from an iron hut, with a structure, painted white and 20 feet (6^m1) in height, situated on the slope of the headland. A radiobeacon transmits 20 from this lighthouse.

Punta de los Farallones, eastward of Cabo Nuevo, and separated from it by a deep gorge, is a fourth point, which, from northward, appears conical, and has some above-water rocks close off it.

From Punta de los Farallones, the coast trends south-south-eastward, 25 for a short distance, to a fifth point, at the foot of which is an islet, which shows up well from northward or southward.

All the foregoing points are dominated by high land, and end in conical peaks from 1,400 to 1,500 feet (426^m7 to 457^m2) high, so that the northern side of the promontory presents a volcanic appearance. 30

Los Farallones are three low islets within one mile of the coast between Punta de los Farallones and the point southward of it.

A light is exhibited, at an elevation of 64 feet (19^m5), from a red tower with a white band, 16 feet (4^m9) in height, situated on Farallon Grande, the northernmost and largest of Los Farallones. 35

Laja Lupiana is awash and is usually marked by breakers, and lies about one cable north-north-eastward of Farallon Grande.

There is a deep channel between this rock and Los Farallones, and also between the islets themselves, but these passages should not be attempted, except in an emergency, on account of the north-west- 40 going currents in their vicinity.

The channel between the whole group and the coast has depths of from 5½ to 8 fathoms (10^m1 to 14^m6), and is used by local vessels, but should not be attempted without local knowledge.

Coast.—From Punta de los Farallones, the coast, *see view facing* 45 *page 284*, trends about 8½ miles southward to Melilla; it is steep-to and free from off-lying dangers. It decreases in elevation as Melilla is approached, and in it are Cala Viñas, Cala Teident or Blanca and Cala Triga, small unimportant beaches, separated by rocky points, which are the terminations of rugged spurs descending from the hills. 50

Anchorage.—Anchorage, sheltered from westerly winds, can be obtained by vessels with local knowledge, off Cala Viñas, in a depth of about 9 fathoms (16^m5), sand, but a reef extends for a short distance from the southern point of the cove, and in the northern part are some rocks.

Charts 2717, 2158a.

Chart 2437, plan of Melilla.

Melilla.—Lights.—Light-buoy.—This fortified town (*Lat. 35° 17' N., Long. 2° 57' W.*) is easily identified by its white building and stands partly on a small, rocky peninsula connected with the mainland
 5 by a narrow isthmus 95 feet (29^m0) high, but the major part stands on the mainland extending southward to, and beyond, Rio del Oro, the mouth of which is about half a mile wide.

Fuerte del Rosario stands on a hill 184 feet (56^m1) high, about 4 cables north-westward of the peninsula, and is a good mark.

10 A light is exhibited, at an elevation of 131 feet (39^m9), from a tower with a gallery surmounting a building, painted dark grey with the top of the lantern painted aluminium colour and the lower part covered with green tiles, 39 feet (11^m9) in height, situated on the north-eastern bastion of the ramparts of Torreón de las Cabras or Del Bonete, at the
 15 north-eastern end of the peninsula.

Muelle de Villanueva extends about 1½ cables eastward and thence one cable south-south-eastward from the eastern side of the peninsula. Along its inner side are wharves, with depths of, in 1948, from 20 to 23 feet (6^m1 to 7^m0) alongside. Dique Nordeste extends about 2 cables
 20 eastward and thence about 1½ cables south-south-eastward from the elbow of Muelle de Villanueva.

A light is exhibited, at an elevation of 72 feet (21^m9), from a dark-grey, masonry tower, situated on the head of Dique Nordeste.

Muelle de Segunda Rama extends about one cable south-south-
 25 eastward from the inner part of Dique Nordeste.

A light is occasionally exhibited, at an elevation of 23 feet (7^m0), from a post situated on the head of Muelle de Segunda Rama.

Muelles de Ribera form the seaward sides of a rectangular piece of reclaimed land on the southern sides of the peninsula. There were
 30 depths alongside the eastern and southern quays, in 1948, of from 20 to 25 feet (6^m1 to 7^m6). On the western side of this reclaimed land is a small boat harbour which is continually silting up.

A light is exhibited, at an elevation of 21 feet (6^m4), from a metal column, 16 feet (4^m9) in height, situated on the eastern side of the
 35 entrance to the boat harbour.

A light is exhibited, at an elevation of 21 feet (6^m4), from a metal column, 13 feet (4^m0) in height, situated on the western side of the entrance to the boat harbour.

Muelle de Becerra extends about 1½ cables southward from the
 40 south-western corner of the boat harbour. The depths alongside it are shoal.

Muelle Cargadero de Minerales, a mole for loading mineral ore, extends about 1½ cables eastward from a position about one-quarter of a cable within the head of Muelle de Becerra. In 1948, there were
 45 depths of from 16 to 27 feet (4^m9 to 8^m2) alongside this mole.

A light is exhibited, at an elevation of 39 feet (11^m9), from a concrete column, 33 feet (10^m1) in height, situated on the head of Muelle de Cargadero de Minerales (*Lat. 35° 8' N., Long. 2° 57' W.*).

Dique Sur extends about 5½ cables north-north-eastward from a
 50 position about one mile south-eastward of the mouth of Rio de Oro.

A can light-buoy, exhibiting a *red flashing* light, *every three seconds*, is moored about 2 cables north-north-eastward of the head of Dique Sur.

Flagstaff.—Signals.—A flagstaff, from which traffic and storm

Charts 2717, 2158a.

Chart 2437, plan of Melilla.

signals are displayed, is situated near the south-eastern end of Muelles de Ribera. The following signals are displayed from one or both yard-arms of this flagstaff when necessary :—

<i>By day</i>	<i>By night</i>	<i>Signification</i>
Two cones, points upwards, disposed vertically	Three <i>red</i> lights, disposed vertically	Port closed. N.E. gale expected. Vessels advised to anchor off Cala Tramontana or Islas Chafarinas.
Two cones, points downwards, disposed vertically	Two <i>red</i> lights, disposed vertically	N.W. gale expected. Vessels recommended to anchor with two anchors.
Two balls, disposed vertically	One <i>red</i> light above one <i>white</i> light	Vessels should anchor in the bay, as the moles are occupied.
Ball, over cone with point up	One <i>white</i> light above one <i>red</i> light	Remain outside the port; pilot will board when opportunity offers.
Two balls on one yard-arm, and two cones, points upwards, on the other yard-arm, disposed vertically	One <i>white</i> light above one <i>red</i> light, on each yard-arm	Indications of bad weather, and entrance is dangerous. Moorings should be strengthened and engines should be available in vessels not considered secure.
Two cones, points downwards, one on each yard-arm	Two <i>red</i> lights, disposed horizontally, one on each yard-arm	Shift anchorage as that selected is in vicinity of telegraph cables.
One cone, point down, above a ball	One <i>red</i> light above one <i>white</i> light, one on each yard-arm	The pilot is coming to berth you; have engines ready.
Two balls, with a cone, point up, between them, disposed vertically	Three lights, disposed vertically, the upper one <i>white</i> , the two lower ones <i>red</i>	Remain outside the port until this signal is hauled down, as other vessels are manoeuvring inside the harbour.
Two cones, points up, with a ball between them, disposed vertically	Two <i>red</i> lights above one <i>white</i> light, disposed vertically	Weather unsuitable for pilot to board. Enter the port with due precaution; the pilot will issue directions from the landing place.
One cone, point down, above a ball, on each yard-arm	Three lights, disposed vertically, the upper and lower <i>red</i> , and the centre one <i>white</i>	Warning of bad weather, for fishermen.
A flag displayed at each yard-arm, hoisted and lowered constantly	Two <i>red</i> lights, disposed horizontally, exhibited intermittently	Warns a vessel that she is standing into danger.

Note:—In addition to the above, a white flag with a blue cross, 5 displayed from the flagstaff, indicates the arrival of a warship, and house-flags of various companies announce the arrival of a vessel of the company indicated.

Anchorage. — Directions. — Current. — Anchorage can be obtained off Melilla as convenient; the bottom is composed of muddy 10 sand. The best berth is, in a depth of about 8 fathoms (14^m6), with the lighthouse on the peninsula in line with the head of Dique Nordeste. Vessels with local knowledge can anchor closer inshore. Vessels anchoring southward of Dique Nordeste should keep the clock-tower

Charts 2717, 2158a.

Chart 2437, plan of Melilla.

on the peninsula open eastward of the head of Muelle de Santa Barbara (*Lat. 35° 17' N., Long. 2° 57' W.*).

The anchorage is exposed to easterly winds, on the approach of which vessels should seek shelter either at the anchorage in Islas Chafarinas, *see* page 279, or in the lee of the promontory of Cabo Tres Forcas. These winds, however, are neither frequent nor of long duration, but they are often preceded by a considerable swell, and by clouds over Monte Gurugú, *see* below.

10 The current in the anchorage is usually south-going.

Pilotage.—Pilotage is compulsory, except for vessels under 50 tons. The pilots' boats are painted white, with a black P on either bow; by day they fly a blue flag with a white P on it, and at night they exhibit a white light. A vessel requiring a pilot should hoist the customary signal, by day, and at night should burn a flare every quarter of an hour, or exhibit a white flashing light; in addition four long blasts followed by four short ones should be sounded on the siren or whistle.

Prohibited anchorage.—**Buoy.**—An area, in which anchorage is prohibited on account of submarine cables, exists northward of the entrance to the port; the southern limit of this area is indicated by a pecked line on the chart. A special buoy, painted white on its upper half and green on the lower half, with "*Telégrafos-Cable*" inscribed on it, is moored on the southern limit of the prohibited area, about 8 cables east-north-eastward of the head of Dique Nordeste.

25 **Life-saving.**—A lifeboat is stationed, and life-saving appliances are maintained, at Melilla. *See* page 15.

Port facilities.—**Communications.**—Provisions and water, which is scarce, can be procured. Stocks of coal and fuel oil are maintained.

Minor repairs can be executed. There are several cranes and two small tugs.

There are several hospitals. For deratisation, *see* page 22.

The wharves are connected with the railway system. There is regular steamer communication with Spain, Ceuta and Oran.

There is regular communication by air with Tangiers, Tetuan and Spain.

For radio communication, *see* page 21.

A British Consular officer resides in the town.

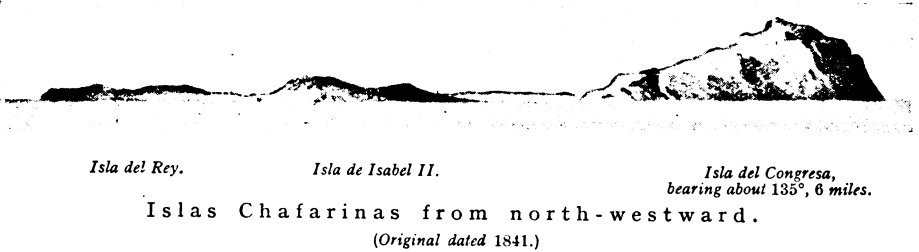
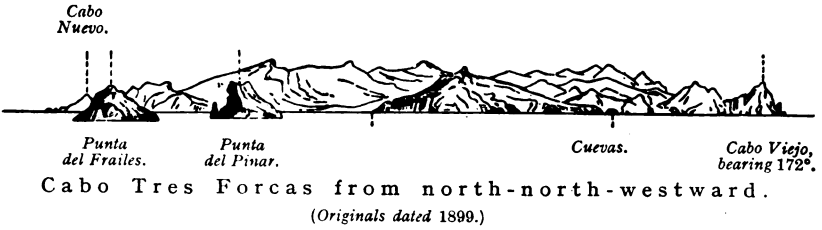
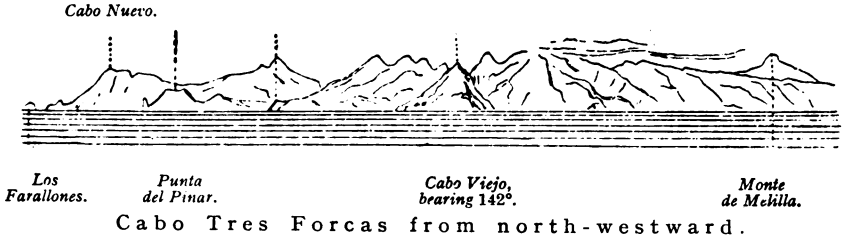
Chart 2437.

Coast.—**Light.**—Monte Gurugú or de Melilla is situated about 6 miles south-south-westward of Melilla, and slopes gently to the sea. It has several peaks, one of which attains an elevation of 3,225 feet (983^m0). When seen from north-north-eastward, two of its peaks form a conspicuous saddle; at the foot of the mountain is a hill, surmounted by a white shrine, with a small wood on one side of it. When the western side of the mountain is covered with light misty clouds, a levanter, which will later reach the roadstead at Melilla, has already started to blow; if, however, clouds hang over the eastern side of the mountain, westerly winds may be expected.

From Melilla, a sandy beach backed by a narrow strip of land, covered with low dunes and separating Mar Chica from the sea, extends about 15 miles south-eastward to Punta Quiviana (*Lat. 35° 07' N., Long. 2° 45' W.*).

Mar Chica, or Puerto Nuevo, is an extensive lagoon, into which a channel has been dredged, about 3 miles south-eastward of Melilla.

Charts 2717, 2158a.

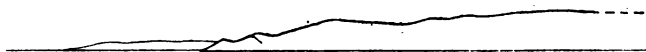




Djebel Orousse. *Djebel Krichfel.* *Rocher de l'Aiguille,*
bearing 225°, 10 miles.
Rocher de l'Aiguille from north-eastward.



Ravine,
bearing about 110°. *Oued Chélif* from north-north-westward.
(Originals dated 1899.)



Cap Ivi,
bearing 070°, 20 miles.
Cap Ivi from west-south-westward.
(Original dated 1932.)

Chart 2437.

This channel, in which the tidal streams attain a rate of 6 knots at times, has a least depth of 6 feet (1^m8), and is only available with local knowledge.

Monte Atalayón, a conical hill on the western side of Mar Chica, about 5½ miles south-south-eastward of Melilla, is joined to the shore on that side by a small sandy isthmus.

A light is exhibited, for the use of aircraft, at an elevation of 56 feet (17^m1), from a position about 5½ miles south-south-eastward of Melilla.

La Restinga de Tofiño is a large black rock, with several small rocks round it, on the beach about 3 miles north-westward of Punta Quiviana, and between them the coast is fronted by a reef of rocks on which the sea breaks with easterly winds, and between which are passages giving access to the beach.

Punta Quiviana is rocky and of no great elevation. Close off it are several islets, one of which is high and conical.

From Punta Quiviana, the coast trends about 16 miles eastward to Cabo del Agua. On the eastern side of Punta Quiviana there is a short sandy beach, which is succeeded by a line of cliffs, from 50 to 65 feet (15^m2 to 19^m8) high in places, with here and there beaches at its foot.

Cordillera de Quiviana or Kebdana lies parallel with and from 4 to 6 miles inland of the coast between Punta Quiviana and Cabo del Agua, and the seaward slopes are well-watered, fertile, and populated.

Monte Tessan, about 8 miles south-eastward of Punta Quiviana, rises to an elevation of 3,274 feet (997^m9), and on either side of its summit are fissures, that on the western side being open when bearing 153°, and that on its eastern side being visible when bearing 225°.

Monte Berard, about 5 miles eastward of Mount Tessan, rises to an elevation of 2,250 feet (685^m8). From certain directions it appears conical, but when bearing 135° its summit is saddle-shaped.

Cabo del Agua (*Lat. 35° 09' N., Long. 2° 25' W.*), see plan on chart 2437, is 131 feet (39^m9) high, and from it a rocky reef extends for about 80 yards (73^m1). On this flat headland is an encampment protected on its landward side by a low wall.

From Cabo del Agua, a sandy beach with no off-lying dangers, but towards the western part of which the depths shoal very gradually, trends about 11 miles east-south-eastward to the mouth of Rio Skiss or Oued Kiss.

Rio Muluya flows into the sea about 3½ miles eastward of Cabo del Agua, and is one of the largest rivers in Morocco.

Playa Tazagraret lies between the mouth of Rio Muluya and that of Rio Skiss or Oued Kiss, and the latter river forms the seaward end of the boundary between Morocco and Algeria.

Chart 2437, plan of Islas Chafarinas.

Off-lying islands.—Dangers.—Lights.—Islas Chafarinas lie about 2 miles northward of Cabo del Agua, and are three in number. They are of volcanic origin, and consist of white decomposed rock. When seen from eastward or westward they show up well, but from northward, they are difficult to distinguish, at a distance, from the land behind them. See view facing page 278.

Isla del Congreso, the largest and westernmost island, is steep and rugged on its western side, where it attains an elevation of 449 feet (136^m9), but on its eastern side the slope is more gentle. The northern

Charts 2717, 2158a.

Chart 2437, plan of Islas Chafarinas.

and eastern sides of the island are fringed with rocks, and at its southern extremity there is a landing place.

Banco del Congreso, with a depth of 10 feet (3^m0), rock, lies about 5 2 cables north-eastward of the northern extremity of Isla del Congreso.

A light is exhibited, at an elevation of 118 feet (36^m0), from a grey circular tower, 10 feet (3^m0) in height, situated on the southern extremity of Isla del Congreso.

Isla de Isabel II lies eastward of Isla del Congreso, from which 10 it is separated by a deep channel about 3½ cables wide. It is about 130 feet (39^m6) high, and near the middle of its northern side is Torre de la Conquista, which is fitted with a prominent clock, the top of which is elevated 187 feet (57^m0). On this island there are numerous large white buildings, including a hospital. There is steamer communi-
15 cations with Malaga and Melilla.

A light (*Lat.* 35° 11' N., *Long.* 2° 27' W.) is exhibited, at an elevation of 170 feet (51^m8), from a white tower surmounting a dwelling, 59 feet (18^m0) in height, situated near the north-western extremity of Isla de Isabel II. *See* view facing page 264.

20 A light is exhibited from a metal column, 30 feet (9^m1) in height, situated on the head of a small mole near the southern extremity of Isla de Isabel II.

Isla del Rey, the smallest and easternmost of Islas Chafarinas, lies close eastward of Isla de Isabel II, with which it is connected by
25 a mole, which latter has been breached about its centre. The island attains its maximum elevation, of 112 feet (34^m1), near its northern end, and its eastern side is cliffy and indented; at the southern end of the island is a cemetery.

Chart 2437.

30 The channel between Islas Chafarinas and Cabo del Agua is about 1½ miles wide, and is free from dangers, but the depths in its southern part, that is, within 1½ miles of the cape, are less than 6 fathoms (11^m0). The colour of the sea is no guide to the depths, on account of the muddy water discharged by Rio Muluya.

35 *Chart 2437, plan of Islas Chafarinas.*

Anchoragees.—Submarine cables.—Islas Chafarinas afford the only natural anchorage off the coast of Morocco which is suited to all classes of vessels. The anchorage is in depths of from 5½ to 9 fathoms (10^m1 to 16^m5), and the holding ground is good, being of muddy sand.

40 In winter, southerly winds sometimes blow, with strength, and with strong easterly winds a considerable swell rolls into the anchorage. Strong north-westerly winds send a considerable sea into the anchorage, through the channel between the two western islands despite the shoal in its approach.

45 The best berth, sheltered from north-easterly winds, is about 1½ cables south-eastward of the head of the small mole near the southern end of Isla de Isabel II, in a depth of about 8 fathoms (14^m6). Small vessels can anchor closer inshore, with their sterns secured to the mole.

Caution must be exercised to avoid anchoring in the vicinity of the
50 submarine telegraph cables, *see* page 19, the routes of which are indicated by wavy lines on the plan.

The currents in the anchorage are influenced by the prevailing wind, and on very rare occasions an exceptionally strong current has been experienced during calm weather.

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Chart 2437.

Small vessels, with local knowledge, can obtain anchorage, sheltered from winds between south-west and north-west, in depths of from $1\frac{1}{2}$ to $2\frac{1}{2}$ fathoms (2^m7 to 4^m1), in the bay on the eastern side of Cabo del Agua, but care must be taken to avoid the submarine telegraph cable, *see* page 19, which is landed near a conspicuous hut, and the route of which is indicated on the plan. Landing can be effected at a small mole at the head of the bay. 5

Chart 2158a.

ALGERIA.—General remarks.—The coast of Algeria (which is 10 called by the French Algérie) extends about 550 miles eastward from the mouth of Oued Kiss to Cap Roux, and is for the most part bold. A few islets lie off it, but none is more than 6 miles offshore.

It is high and in places mountainous, especially in its eastern part, where it is dominated by the mountains of Kabylie. 15

The more salient parts are generally faced with cliffs, and the bays have beaches of sand or shingle at their heads.

Nearly all the streams have bars of sand at their mouths during the summer, and it is only in winter that channels are formed of sufficient depths to permit small craft to enter with ease. 20

Except in the vicinity of the towns, the coast is scarcely populated.

Chart 2437.

Coast.—Dangers.—Signal station.—Le Kiss (Port Say) is a village situated about half a mile eastward of Oued Kiss, and close to it, surmounting a bluff promontory, stands a white minaret. On the 25 crests of the hills dominating this village are westward some ruins, and eastward the white tower of Cap Milonia signal station, situated, at an elevation of 696 feet (212^m0), on the summit of Daklak, a hill close southward of Cap Milonia. This signal station operates by day only ; *see* page 10. 30

Cap Milonia (*Lat.* $35^{\circ} 06' N.$, *Long.* $2^{\circ} 09' W.$), about $2\frac{1}{2}$ miles north-eastward of Le Kiss, appears from northward as a rocky mass between two extensive beaches. The cape is bordered by foul ground, and should not be approached closely.

Port Kela is on the eastern side of Pointe Bou Madane, about 2 miles 35 eastward of Cap Milonia ; in it is a transporter for loading ore, off which are mooring buoys ; there is reported to be a depth of $23\frac{1}{2}$ feet (7^m2) at the berth.

Bled Tabarit is a point situated about 4 miles east-south-eastward of Pointe Bou Madane ; it is bordered by rocks extending as much as 40 $2\frac{3}{4}$ cables offshore. Nemours lighthouse (page 282) well open northward of Ras Kela, with the latter bearing more than 082° , leads northward of these dangers.

Ras Kela lies about 5 miles eastward of Pointe Bou Madane, and between it and Nemours, about 7 miles eastward, the coast is high and 45 rocky and is indented by several bays, which are open northward.

Mersa Oulad ben Ayed (Oben Aïd), close eastward of Ras Kela, is available for small craft with local knowledge, but on the eastern side of its entrance are some above-water and sunken rocks, within $1\frac{1}{2}$ cables of the coast, to clear which the signal station of Daklah should be kept 50 open northward of Ras Kela, with the latter bearing less than 275° .

Pointe Riba is about 4 miles eastward of Ras Kela, and about one mile south-eastward of it El Farss (Frass) rises to an elevation of about

Charts 2717, 2158a.

Chart 2437.

1,000 feet (304^m8). The point is bordered by foul ground extending about 3 cables offshore and about 6 cables north-north-eastward of it is a detached 5-fathom (9^m1) patch.

- 5 Ilot Pigeonnier, about one mile eastward of Pointe Riba, is a large, steep-sided rock, lying close off a point.

El Anabra (Anafra) is a village on the western entrance point of the bay of the same name; the point is about half a mile north-eastward of Ilot Pigeonnier, and close north-westward of it are some rocks. From

- 10 El Anaфра, the coast extends about 3 miles north-eastward to Nemours.

Anchorage.—Open anchorage can be obtained north-north-westward of Le Kiss, in a depth of about 6½ fathoms (11^m9), mud and sand, with Cape Milonia bearing about 080°.

Chart 178, plan of Nemours.

- 15 **Nemours.**—**Lights.**—**Buoyage.**—This town, with a population, in 1948, of about 7,500, is situated on the southern side of a small artificial harbour in the eastern part of a bay. At the eastern end of the bay, a tableland, 423 feet (128^m9) high, dominates the town, and is surmounted by a disused lighthouse and some ruins, amongst which latter
20 are those of a conspicuous blockhouse. There is a fishing-boat harbour near the western entrance point of the bay.

- The harbour, which, in 1949, had depths of from 25 to 35 feet (7^m6 to 10^m7), is protected on its northern and western sides by two jetties, the entrance between the heads of which is about half a cable wide
25 and faces north-westward. The entrance is sheltered by a breakwater which extends westward from a position about three-quarters of a cable northward of the head of the northern jetty. There is no passage, except for small craft, between the head of the northern jetty and the eastern end of the breakwater. This harbour affords good shelter,
30 but entry during westerly winds requires care. The southern part of the harbour is lined with quays, which have depths of from 26 to 32 feet (7^m9 to 9^m8) alongside.

- Les Deux Frères, two columnar rocks, the higher of which is 66 feet (20^m1) high, lie about 1½ cables northward of the western entrance point
35 of the bay, and between them and the point are two other above-water rocks, named Les Sœurs.

A light is exhibited, at an elevation of 305 feet (93^m0), from a tower surmounting a building, 36 feet (11^m0) in height, situated on the western entrance point of the bay.

- 40 A light is exhibited, at an elevation of 88 feet (26^m8), from a red metal tower, 13 feet (4^m0) in height, situated on the western rock of Les Deux Frères.

- Lights are exhibited, at elevations of 39 feet (11^m9), from iron towers, the eastern painted red and the western black, situated on the
45 ends of the breakwater (*Lat. 35° 06' N., Long. 1° 52' W.*).

A light is exhibited, at an elevation of 25 feet (7^m6), from the head of each of the two jetties at Nemours.

A pilot is available, *see* page 20. No vessel should attempt to enter without local knowledge.

- 50 **Anchorage.**—Open anchorage can be obtained off the harbour at Nemours, northward of the breakwater, in depths of from 10 to 12 fathoms (18^m3 to 21^m9), fairly good holding ground of fine sand.

- Small vessels can anchor in depths of from 3 to 5 fathoms (5^m5 to 9^m1), sand, about midway between Les Deux Frères and the western
55 jetty.

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Chart 178, plan of Nemours.

Port facilities.—Communications.—A small stock of coal is maintained. Water is available. Minor repairs can be effected. There are a small slip and a three-ton crane.

Regular steamer communication is maintained with other Algerian ports and with Marseille.

Life-saving.—Life-saving appliances are maintained at Nemours.

See page 15.

Chart 2437.

Coast.—Dangers.—From Nemours, a high rocky coast, *see 10.* view facing page 284, trends about 3 miles north-eastward to Cap Tarsa.

Fillaoussène, 3,727 feet (1,136^m0) high, and Tadjera, 2,825 feet (861^m0) high, are situated, respectively, about 9½ miles south-south-eastward and 7 miles eastward of Cap Tarsa, and are the best distant 15 landmarks along this stretch of coast.

Cap Tarsa is a whitish, rocky, double headland, close eastward of which lies Baie Erkène, which affords temporary shelter from westerly winds.

Pointe de Lalla Setti (Lella Selti) lies about 1½ miles south-eastward 20 of Cap Tarsa, and on its eastern side lies a small bay with a sandy beach.

A rock, with a depth of 2 fathoms (3^m7), lies about 5 cables eastward; and a rock, with a depth of 2½ fathoms (4^m6), lies about 7 cables east-north-eastward of Pointe de Lalla Setti. 25

Mersa Arobat and Oued Kiouma are two noticeable breaks in the line of rocky cliffs, which are over 300 feet (91^m4) high, and extend about 5½ miles north-eastward from the eastern entrance point of the small bay which is entered eastward of Pointe de Lalla Setti, to Cap 30 Noé (*Lat. 35° 11' N., Long. 1° 41' W.*).

Baie de Honain lies on the eastern side of Cape Noé, and behind the sandy beach at its head, about 1½ miles eastward of the cape, are the ruins of a town, close north-eastward of which stands a prominent tower. On the north-eastern side of the bay are several piers for loading ore; there are depths of 3½ fathoms (5^m9), about three-quarters 35 of a cable offshore.

Mersa Agla is the southern of two creeks about 2 miles north-north-eastward of the above-mentioned tower; the northern creek is available to small craft, with local knowledge, and close northward of it is a rock almost joined to the coast. 40

El Mokreun is a prominent islet lying close inshore about 3½ miles north-eastward of Cap Noé; at its western end are two pointed rocks about 130 feet (39^m6) high. The passage inshore of the islet is obstructed by rocks.

Bordj Oulad Amar is a ruined tower, on the coast south-eastward of 45 El Mokreun, overlooking a cove in which landing can be effected.

Loubar Damah, about 2½ miles north-eastward of El Mokreun, is a small peninsula that may be identified by three rocks lying close off it; on either side are coves, the south-western one being available to small craft with local knowledge and the north-eastern one having a shingle 50 beach.

El Karouch (Karush) is a point about 2½ miles north-eastward of Loubar Damah, and about one mile southward of it Sidi Yacub rises to an elevation of 978 feet (298^m1). Bou Keltoum, about 1½ miles

Charts 2717, 2158a.

Chart 2437.

eastward of the point, is 1,200 feet (365^m8) high, and on its summit is a prominent watch tower.

A rock, with a depth of 2 fathoms (3^m7), lies about 2½ cables offshore, 5 8 cables west-north-westward of Sidi Yacub.

Île Ronde (*Lat.* 35° 17' N., *Long.* 1° 33' W.) lies about 2½ cables northward of El Karouch. It attains an elevation of 92 feet (28^m0) and its sides are vertical.

From El Karouch the coast trends about 4 miles north-eastward to 10 Cap Bocchus (Boshus).

Anse de Sidi Madani, about 2½ miles eastward of El Karouch, is bordered by remarkable red and yellow cliffs, and on the summit of a hill southward of it stands a shrine.

A current usually sets along this stretch of coast according to the 15 direction of the wind.

Anchorage.—Baie Erkène affords temporary shelter from westerly winds.

Baie de Honain affords anchorage, to small vessels with local knowledge, but it is exposed to north-westerly winds.

20 *Chart 178, plan of Rashgoun island.*

Île Rachgoun.—Dangers.—Light.—Île Rachgoun (Rashgoun) lies about 1½ miles northward of Cap Bocchus. It is barren, flat-topped and 213 feet (64^m9) high. At its southern end there is a custom house with a landing place close by. Rocks, with depths of 1½ fathoms 25 (2^m7), lie within one cable northward of the island. The southern side is fringed with rocks, some of which are above water, extending as much as half a cable offshore. See view facing page 278.

A light is exhibited, at an elevation of 269 feet (82^m0), from a square tower surmounting a dwelling, 49 feet (14^m9) in height, situated near 30 the northern end of Île Rachgoun.

The navigable channel between the island and the mainland is over half a mile wide, and a vessel using it should favour the island side.

A current usually sets through the channel in an easterly direction.

Anchorage.—Indifferent anchorage can be obtained in the channel 35 southward of Île Rachgoun. Small vessels anchor as close under the lee of the island as possible, and vessels of moderate size anchor about one cable offshore, selecting a position according to the direction of the wind. The bottom is of mud and sand, but there are numerous rocky patches which must be avoided.

40 **Coast.—Dangers.**—From Cap Bocchus, the coast trends about 1½ miles north-eastward to Cap d'Acra, and between them lies Baie de la Tafna.

A rock, with a depth of 5 fathoms (9^m1), lies about half a mile westward of Cap Bocchus, and between are some detached rocks with 45 a least depth of 2½ fathoms (4^m1).

Îlot Siga (*Lat.* 35° 18' N., *Long.* 1° 29' W.) is 59 feet (18^m0) high and lies within three-quarters of a mile northward of Cap Bocchus, and between them there are some above-water rocks lying on a shoal bank.

Baie de la Tafna has a sandy beach through which La Tafna rivière 50 flows into the sea. Eastward of the river mouth the shore is backed by cliffs.

Pointe de la Tour du Maure, the north-eastern entrance point of Baie de la Tafna, is dominated by a ruined tower. Within one-quarter of a mile south-westward of the point is a shoal bank on which are a

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a

Oued Kiss.

a

a

Monte Tissan.
Monte Berard.

Islas Chafarinas,
bearing 251°, 16½ miles.

Cabo Tres
Forcas.

View, in two parts, of coast between Cabo Tres Forcas and the mouth of Oued Kiss.
Fillaoussine.

Cap Oulassa.
Baie de la
Tafna.

Cap Nol. Tadjera.

Nemours
lighthouse, bearing 132°,
15½ miles.

Coast from Nemours to Baie de la Tafna.
(Originals dated 1873.)

Sidi Mérouane.

Gourava.

Cap Ténès,
bearing 100°, 33 miles.

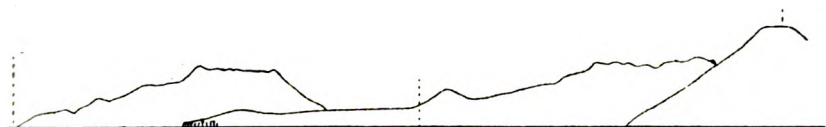
Ténès.

Cap Ténès from westward.
(Original dated 1883.)



*Summit,
bearing 260°, 40 miles.*

Cap Ténès from eastward.

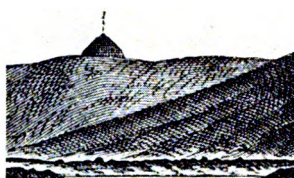


Cherchell.

*Ilot Tokikt-Indich,
bearing about 093°.*

Approaches to Cherchell from westward.

(Originals dated 1932.)



Tombeau de la Chrétienne, bearing 125°, 3 miles.



Guyotville.

Chenoua.

Pointe Acras.

Pointe Acras from north-eastward.

(Originals dated 1906.)

Chart 178, plan of Rashgoun island.

number of above-water rocks, and within $1\frac{1}{2}$ cables north-westward of the point there are depths of from $1\frac{3}{4}$ to $2\frac{1}{2}$ fathoms (3^m2 to 4^m6).

Chart 2437.

From Cap d'Acra, the coast trends about 7 miles east-north-east-ward to Cap Oulassa (Gros) and is high and rich in iron ore. Near the middle of this stretch of coast is Beni Saf, about 8 cables eastward of which is a conspicuous conical rock.

Chart 178, plan of Port Beni Saf.

Beni Saf.—Lights.—This town had a population of about 10,000 in 1948, and the artificial harbour at it is maintained for the export of the products of the iron mines in the vicinity.

The harbour consists of two jetties, the entrance between the heads of which is about one cable wide, and faces north-eastward. The harbour is liable to silt in winter, and depths of about 29 feet (8^m8) are maintained by dredging; but a shoal bank borders the heads of both jetties and extends a short distance from the south-eastern side of the north-western jetty.

A light (*Lat. $35^{\circ} 19' N.$, Long. $1^{\circ} 23' W.$*) is exhibited, at an elevation of 39 feet (11^m9), from a column, 30 feet (9^m1) in height, situated on the head of the south-western jetty.

A light is exhibited, at an elevation of 20 feet (6^m1), from a lantern situated on the head of the north-eastern jetty.

Pilots are available, and should be employed by vessels not in possession of local knowledge, *see* page 20.

Entry is somewhat difficult with fresh northerly or north-westerly winds, and in bad weather is dangerous. During north-north-westerly gales, the sea sometimes breaks about one mile off the harbour.

Vessels can anchor in the harbour and secure their sterns to one of the jetties; the holding ground is good and of fine sand. Vessels drawing up to 23 feet (7^m0) can secure alongside a quay, 180 feet (54^m9) long, constructed on the western side of the north-eastern jetty.

Port facilities.—Water is laid on to the south-western jetty at Beni Saf. Minor repairs can be executed. There is a 30-ton floating sheer-legs.

Life-saving.—Life-saving appliances are maintained at Beni Saf. *See* page 15.

Chart 2437.

Coast.—Dangers.—Cap Oulassa rises to El Ghouaria (Awaria), a rounded conical summit 896 feet (273^m1) high.

Baie de Camérata is entered about 2 miles eastward of Cap Oulassa, and from its head, the coast, which consists of vertical cliffs about 300 feet (91^m4) high, trends about 14 miles north-north-eastward to Cap Figalo (Fegalo).

Rio Salado flows into the sea about $5\frac{1}{2}$ miles north-north-eastward of Baie de Camérata, at the northern end of a remarkable beach.

Sidi Kacem (Kassem), *see* view A on chart 2437, Dar Mengel and Touita are three prominent peaks which lie within 5 miles of the coast and are 1,165 feet (355^m1), 978 feet (298^m1) and 1,007 feet (306^m9) high, respectively.

Charts 822 and 2437.

Cap Figalo (Fegalo) shows up well, and rises steeply to a rounded hill (*Lat. $35^{\circ} 35' N.$, Long. $1^{\circ} 12' W.$*), 597 feet (182^m0) high, surmounted by a signal station. Close off this cape lie a number of

Charts 2717, 2158a.

Charts 822 and 2437.

conical rocks, and about 3 cables westward of it there is an islet with a pointed summit.

Chart 822.

- 5 Mersa Bou Zadjar (Buzudjar) is entered close eastward of Cap Figalo. In its eastern side is a small creek, forming the mouth of Oued el Farod (Wad Kubi), which is sheltered from northerly and easterly winds.

From Cap Figalo, the coast trends about 11 miles north-eastward to 10 Cap Sigale or Blanc, and is backed by hills from 1,100 to 1,300 feet (304^{m8} to 396^{m2}) high, the most prominent summits of which are:—Mezzaita (Mzaita), 1,305 feet (397^{m8}) high; Touila, 1,217 feet (370^{m9}) high; M'Garat, 1,102 feet (335^{m9}) high; and Hammar Ezzenine (Ksebis), 1,086 feet (331^{m0}) high.

- 15 Lalla Kadra, a steep-faced headland 620 feet (189^{m0}) high, is fringed with rocks and lies about 7 miles north-eastward of Cap Figalo. On either side of it are coves, on the south-western side Mersa Ali Bou Nouar (Ben Nuar), and on the north-eastern side Mersa Madakh (Madagre).

- 20 Mersa Ali Bou Nouar is deep and narrow. A rock, with a depth of less than 6 feet (1^{m8}), lies about 1½ cables north-westward of a point on the western side of the cove.

A steep-to islet, 112 feet (34^{m1}) high, lies close inshore about 2½ miles north-north-eastward of Lalla Kadra, and abreast and close southward 25 of it are some small creeks, sheltered by rocks, in which landing can be effected.

Écueil de la Falaise Blanche, with a depth of 6 feet (1^{m8}), lies about one mile south-south-westward of the above-mentioned islet, and about 2 cables northward of a rocky spit, named Ben Habibas.

- 30 Cap Sigale or Blanc is a large rounded projection, about 1,000 feet (304^{m8}) high, faced with a conspicuous white cliff, off which lie several above-water rocks. Two rocky patches, with depths of 18 and 13 feet (5^{m5} and 4^{m0}), lie 2½ and 7 cables northward, respectively, of Cap Sigale.

- 35 A current usually sets north-eastward along the coast between Cap Figalo and Cap Falcon, *see* page 8.

Anchorage.—Anchorage, well sheltered from easterly winds, can be obtained 3½ cables offshore, about half a mile southward of the western extremity of Cap Figalo.

- 40 Anchorage can be obtained, by small vessels with local knowledge, in depths of 23 feet (7^{m0}), at the head of Mersa Ali Bou Nouar.

Chart 178, plan of Îles Habibas.

- Îles Habibas.—Dangers.—Light.**—This group consists of two islands and a number of islets or rocks. It lies about 6 miles west- 45 north-westward of Cap Sigale, *see* chart 822, and the larger and south-western island attains an elevation, near its southern extremity, of 344 feet (104^{m8}). The north-eastern island is rounded, flat-topped, and 79 feet (24^{m1}) high.

- A light (*Lat.* 35° 43' N., *Long.* 1° 08' W.) is exhibited, at an elevation 50 of 367 feet (111^{m9}), from a square tower surmounting a rectangular dwelling, 39 feet (11^{m9}) in height, situated on the summit of the south-western island.

The larger island is fringed with reefs, above-water rocks, and shoals extending about one mile south-westward of its south-western side.

Charts 2717, 2158a.

Chart 178, plan of Îles Habibas.

A group of above-water rocks lies on a shoal bank about 8 cables westward of the lighthouse, and a detached 14-foot (4^m3) rocky patch lies about 5½ cables east-north-eastward of the lighthouse.

The passage between the two islands is foul. 5

The smaller island is fringed with rocks, the outermost of which lies within 2½ cables north-eastward of its north-eastern extremity. A detached, 27-foot (8^m2), rocky patch lies about 2½ cables south-eastward of the island.

The currents in the vicinity of the islands are strong and irregular. 10

Anchorage.—Anchorage, sheltered from westerly and north-westerly winds, can be obtained, about 1½ cables from the nearest dangerous rocky patches, in depths of 15 or 16 fathoms (27^m4 or 29^m3), coral and gravel, with the lighthouse bearing 270°, and the summit of the northern island bearing 010°. 15

Small vessels can anchor, in a small bay on the eastern side of the larger island, in a depth of about 8 fathoms (14^m6), sand, within the detached patch east-north-eastward of the lighthouse.

Landing can be effected at a masonry jetty, in the above-mentioned bay, alongside which there is a depth of about 1½ feet (0^m4). 20
Chart 822.

Coast.—Dangers.—Light.—From Cap Sigale, the coast trends about 5 miles north-eastward to Cap Lindles.

Cap Lindles is 961 feet (292^m9) high and faced with steep cliffs. Within one-quarter of a mile northward of it there is a detached, 25 10-foot (3^m0), rocky patch. Tunny nets, *see* page 27, are laid out annually eastward of Cap Lindles.

Baie des Andalouses is entered between Cap Lindles and Pointe Coralès, about 5½ miles north-eastward. On the elevated plains which overlook the bay are the villages of El Ançor and Bou Sfer (Bu Sefer). 30 A bank, with depths of less than 36 feet (11^m0), extends as much as one-quarter of a mile offshore from the head of this bay.

Ben Sabiha (Ain Bemsaabia), about 2½ miles south-westward of Bou Sfer, is a hill, 1,916 feet (584^m0) high, on the summit of which stands an observatory. 35

Plage des Corailleurs lies on the southern side of Pointe Coralès, and about 3½ cables offshore, one mile southward of the point, there is a rock, with a depth of less than 6 feet (1^m8). A bank, with depths of less than 36 feet (11^m0), extends as much as half a mile offshore abreast Plage des Corailleurs. 40

Pointe Coralès (*Lat.* 35° 46' N., *Long.* 0° 49' W.) is the north-western extremity of a promontory, and is about 220 feet (67^m1) high; above-water rocks extend northward from it for about one-quarter of a mile.

Off-lying islets and dangers.—Light.—Les Moules are two rocks, respectively, 20 and 23 feet (6^m1 and 7^m0) high, situated about 1½ miles 45 northward of Cap Sigale; except on their north-eastern side they are steep-to. Rocks, with depths of 26 feet (7^m8), lie 1½ cables north-eastward of Les Moules, and a rocky shoal, with a depth of 33 feet (10^m1), lies about half a mile eastward of them.

A detached rocky patch, with a depth of 13 feet (4^m0), lies about 50 midway between Les Moules and Cap Sigale; and a detached rocky patch, with a depth of 18 feet (5^m5), lies about one-quarter of a mile northward of the cape.

Île Plane, about 3 miles north-eastward of Cap Lindles, is a large

Chart 822.

rock, about 60 feet (18^m3) high. At its north-western and south-eastern extremities are small natural basins which would afford shelter to boats; it is steep-to, except on its western side, where there are 5 some small rocks.

A light is exhibited, at an elevation of 77 feet (23^m5), from a white tower, 20 feet (6^m1) in height, situated on Île Plane.

A detached rocky patch, with a depth of 10 feet (3^m0), lies about half a mile north-north-westward, and a rock, with a depth of 6 feet 10 (1^m8), lies about 2 cables west-north-westward, of Île Plane.

Anchorages.—Baie des Andalouses affords anchorage, sheltered from winds from east-north-east, through south, to west-south-west, in its western part, where the bottom is of sand.

Small vessels, with local knowledge, can obtain anchorage, sheltered 15 from easterly winds, off Plage des Corailleurs, but caution is necessary for the bottom is rocky in places.

ORAN AND APPROACHES. — Dangers. — Lights. — Radio-beacon. — Submarine cables.—Oran is situated at the head of the bight which is entered between Cap Falcon, about 1½ miles eastward 20 of Pointe Coralès, and Cap de l'Aiguille, about 16 miles farther east-north-eastward, *see* view B on chart 2437, and view on chart 1766. This bight is divided into three bays by Pointe de Mers-el-Kébir and Pointe du Canastel. Submarines are prohibited from diving and pilotage is compulsory in the area southward of a line joining Pointe du 25 Mers-el-Kébir and Pointe du Canastel, *see* page 11. Abnormal magnetic variation has been reported near the shores of the bight, especially in the anchorage at Mers-el-Kébir. A west-going current is usually experienced along the shores of the middle and eastern bays.

Cap Falcon is the rocky north-eastern extremity of the promontory 30 of which Pointe Coralès is the north-western extremity. From a distance, eastward, it appears as an island. Close north-eastward of it are two large above-water rocks, and within one-quarter of a mile of its northern side is an islet, surrounded by rocks. Baie des Aiguades is entered on the south-eastern side of the cape.

35 An area in which submarine cables are laid exists in the vicinity of Cap Falcon; its limits are indicated by pecked lines on the chart.

A light (*Lat.* 35° 46' N., *Long.* 0° 48' W.) is exhibited, at an elevation of 341 feet (103^m9), from a grey octagonal tower, 89 feet (27^m1) in height, situated on Cap Falcon.

40 The village of Aïn-el-Turk stands about 2 miles south-eastward of Cap Falcon. A prominent belfry is situated in the village, and some wireless masts about one mile north-westward of it.

Haut-fond d'Aïn-el-Turk, with a depth of 49 feet (14^m9), lies about 1¾ miles offshore, north-eastward of Aïn el Turk.

45 Sidi Bou Ameer, on which there is a prominent mosque, is situated about 1½ miles eastward of Bou Sfer (page 287), and is dominated by Ouled Sidi Bechir el Reh and Aïn el Reggada (Rigada), 1,791 and 1,772 feet (545^m9 and 540^m1) high, respectively.

A light for the use of aircraft is occasionally exhibited, at an elevation of 318 feet (96^m9), at La Senia, about 4 miles southward of Oran. 50

Chart 812.

Pointe de Mers-el-Kébir projects eastward from the foot of Djebel Santon. This hill is about 1,050 feet (320^m0) high and on it stands

Charts 2437, 1766, 2717, 2158a.

Chart 812.

a prominent fortress. Close westward of the fortress is the village of Mers-el-Kébir.

A point, which rises to an elevation of 229 feet (69^m8), is situated about 5½ cables west-north-westward of Pointe de Mers-el-Kébir. 5
A rocky shoal, with a depth of 25 feet (7^m6), lies about 3½ cables westward of the above-mentioned point and one cable offshore.

Djebel Murdjadjo, westward of the town of Oran, is 1,670 feet (509^m0) high; from north-westward and north-eastward it appears flat-topped, with a vertical fall at its eastern end, whence an elevated but 10
lower plain extends eastward to the foot of Djebel Kahar. At the eastern end of Djebel Murdjadjo is the prominent Fort Santa Cruz, standing at an elevation of 1,155 feet (352^m0), and below and close eastward of it is a chapel.

Sainte Clotilde is a village at the northern foot of Djebel Murdjadjo, 15
and eastward of the village, as far as the town of Oran, the coast is cliffy.

Chart 822.

Pointe du Canastel is fringed with rocks and rises to a detached steep-sided, round-topped hill, 404 feet (123^m1) high, backed by cliffs 20
rising to an elevation of 741 feet (225^m9). Between Oran and the point the coast consists of yellow cliffs, above which is a prominent summer resort. Tour Arcole and La Briqueterie lie 2½ miles eastward and east-north-eastward, respectively, of Oran; the latter is 673 feet (205^m1) high. Tunny nets, *see* page 27, are laid out annually about 25
2 miles south-westward of Pointe du Canastel.

Djebel Kahar, or Montagne des Lions, is a prominent, isolated mountain, 2,003 feet (610^m9) high, situated about 2½ miles eastward of Pointe du Canastel. From westward it appears to have a flat top sloping southward; from eastward it appears conical. Tunny 30
nets, *see* page 27, are laid out annually close to the coast westward of this mountain.

Djebel Krichtel, 2,008 feet (612^m0) high, with Djebel Orusse, 2,070 feet (630^m9) high, about 1½ miles eastward of it, lies about 2 miles south-eastward of Cap de l'Aiguille, and on its summit stands 35
a disused signal station. The high cliffy coast westward of this mountain is fringed with rocks extending a short distance offshore.

Cap de l'Aiguille (*Lat.* 35° 53' N., *Long.* 0° 29' W.) is a rocky projection dominated by a hill, 796 feet (242^m6) high. Tunny nets, *see* 40
page 27, are laid out annually, about one cable westward of the cape.

A light is exhibited, at an elevation of 203 feet (61^m9), from a white, circular tower, 36 feet (11^m0) in height, situated on Cap de l'Aiguille. A radiobeacon transmits from this lighthouse.

Anchoragees.—**Caution.**—Baie des Aiguades affords shelter from westerly winds, in depths of from 4½ to 6½ fathoms (7^m8 to 11^m9), to 45
vessels with local knowledge.

Baie du Canastel, which is entered eastward of Pointe du Canastel, affords anchorage to vessels with local knowledge, in a depth of about 5½ fathoms (10^m1). Its southern shore is fringed with rocks, and vessels should not get into depths of less than 30 feet (9^m1). 50

Chart 812.

Prohibited anchorage.—Anchorage is prohibited in the approach to Mers-el-Kébir eastward and northward of the roadstead, in an area, the limits of which are indicated by pecked lines on the chart, extending

Charts 2437, 1766, 2717, 2158a.

Chart 812.

about 2 miles north-eastward of the vicinity of Sainte Clotilde, owing to the existence of submarine cables. See page 19.

Mers-el-Kébir. — Pilotage. — Buoyage. — Moles. — This roadstead lies south-eastward of Pointe de Mers-el-Kébir. This port is not open to navigation; a vessel desiring to enter it must request permission from the naval authorities at Oran, and having obtained it, should proceed towards the entrance to the port of Oran to await a pilot.

10 Jetée Nord extends about 5 cables south-eastward and thence about 5 cables east-south-eastward, from a position about three-quarters of a cable westward of Pointe de Mers-el-Kébir, and, in 1950, works were in progress to extend it eastward, as indicated by pecked lines on the chart. A conical light-buoy, painted black and exhibiting a *green*
15 *fixed* light, is moored off the head of the extension works. A red can buoy, surmounted by a cylinder, is moored about one cable southward of the light-buoy.

A landing jetty, the head of which was in ruins in 1948, is situated at the south-western end of the quay southward of Fort Mers-el-Kébir.

20 The village of Saint André lies about three-quarters of a mile west-south-westward of Pointe de Mers-el-Kébir, and close to it are two small basins, in which there are depths of 31 feet (9^m4) and which are formed by Môle Nord and Grande Môle. Quays extend between Môle Nord and the root of Jetée Nord. In 1950, works were in progress
25 southward of Grande Môle.

A spire stands near the coast about 4 cables south-eastward of Saint André village (*Lat. 35° 44' N., Long. 0° 42' W.*), and a small, white mosque lies about 2 cables south-westward of the spire. A small jetty extends about one-quarter of a cable north-eastward from the
30 coast, about three-quarters of a mile south-eastward of Saint André. Close to the shore between Saint André and this jetty stand numerous chimneys. Sainte Clotilde lies on the southern side of the roadstead about 1½ miles southward of Pointe de Mers-el-Kébir. A tower is situated 2½ cables south-westward, and a white house 1½ cables south-
35 ward of Sainte Clotilde. A breakwater extends from a position about half a mile eastward of Sainte Clotilde to form a basin. In 1950, works were in progress to enlarge this basin and to build quays and moles, as indicated in pecked lines on the chart.

Shoal.—A shoal, with a depth of 39 feet (11^m9), lies about 7 cables
40 north-north-eastward of Sainte Clotilde.

Caution.—In 1950, a large number of buoys and shore marks were in existence in the roadstead in connection with the harbour works in progress. These buoys and marks are liable to frequent changes in position. These works extend across the entrance to the roadstead
45 north-eastward of Sainte Clotilde.

Port facilities.—A stock of coal is maintained. Water is laid on to the quays at Saint André.

Port Oran.—This harbour, consisting of six basins, is protected northward by Jetée du Large, which extends about 1½ miles eastward
50 from Pointe Mona, which point is situated about 2½ miles east-south-eastward of Pointe Mers-el-Kébir.

Pointe Mona (*Lat. 35° 43' N., Long. 0° 39' W.*), on which stands Fort Lamoune, lies at the eastern end of the cliffs under Djebel Murdjadjo, and in its western side there is a remarkable cave.

Chart 812.

The northern side of Avant Port, the eastern basin, is formed by Jetée du Large. The entrance lies between a spur projecting south-south-eastward from Jetée du Large, and Traverse du Large extending north-north-westward from the coast. In 1948, there were depths of 5
from 18 to 80 feet (5^m5 to 24^m4) in this basin.

Bassin Poincaré, next westward, lies between Môle du Ravin Blanc, extending north-north-westward from Cap Blanc, about 1½ miles east-south-eastward of Pointe Mona, and Môle Millerand. A jetty 10
extends about one cable northward from the southern side of this basin, almost dividing it into two parts. In 1950, there were depths of from 26 to 42 feet (7^m9 to 12^m8) in this basin.

Bassin du Maroc lies between Môle Millerand and Môle Jules Giraud, and along its southern side is Quai Henry Beaupuy. In 1948, there were depths of from 20 to 29 feet (6^m1 to 8^m8) alongside the quays 15
of this basin. A disused lighthouse stands on Jetée du Large abreast the middle of this basin.

Bassin Aucour lies westward of Môle Jules Giraud, and along its southern side is Quai du Sénégal. In 1948, there were depths of 31 feet 20
(9^m4) in this basin.

Vieux port is a small basin westward of Bassin Aucour, and between it and the inner end of Jetée du Large is Bassin Gueydon, usually occupied by torpedo craft and submarines.

The health and pilot offices are near the head of the mole between Vieux port and Bassin Gueydon. 25

Westerly winds raise the water level in the port, and easterly ones lower it; the difference between the two levels may amount to as much as 3 feet (0^m9).

Lights.—Buoyage.—A light is exhibited, at an elevation of 217 feet (66^m1), from a hut, 13 feet (4^m0) in height, situated on the edge of the 30
cliffs about half a mile eastward of Cap Blanc.

A conical light-buoy, painted black, exhibiting a *green fixed* light and surmounted by a cone and by a radar reflector, is moored on the line of Jetée du Large. This buoy is moved as the extension works 35
progress.

A light for the use of aircraft is exhibited at La Senia, *see* page 288.

Lights are exhibited from the heads of the three eastern transverse spurs extending southward from Jetée du Large from the north-eastern and north-western corners of Môle Millerand and Môle Jules Giraud, and from the north-eastern and south-eastern corners of the mole 40
between Vieux port and Bassin Gueydon.

In 1950, the lights on Môle Millerand and Môle Jules Giraud were extinguished.

There are several mooring buoys in Avant Port.

Prohibited anchorage.—Anchorage is prohibited in an area in the 45
approach to Port Oran and in Avant Port; the limits of this area are indicated by pecked lines on the chart.

Directions.—Regulations.—Entry in Port Oran (*Lat.* 35° 43' N., *Long.* 0° 38' W.) is easy in fine weather. During westerly gales a current sets southward across the entrance. A vessel should pass 50
eastward of the light-buoy marking the extension of Jetée du Large.

By day, in bad weather, a vessel should approach the entrance and embark the pilot about half a mile northward of the light-buoy. During northerly gales special care is necessary.

Charts 822, 2437, 1766, 2717, 2158a.

Chart 812.

At night, during very bad weather, owing to possible congestion in the harbour, a vessel should keep in the offing till daylight.

When the port is closed, by day, a red flag will be displayed, and, at night, a red light will be exhibited from the flagstaff of the look-out station at Fort Lamoune.

A vessel at anchor in the port, or in the roadstead, requiring a pilot, should, by day, display flag G of the International Code of Signals, and, at night, exhibit two red lights, disposed vertically 6 feet (1^m8) apart. These signals should be accompanied by three long blasts on the whistle or siren.

Port facilities.—Communications.—Oran had a population of about 250,000, in 1948, and in it resides a British Consular officer. There are both civil and military hospitals in the town. For deratisation, see page 22.

Provisions are plentiful; water is laid on to the wharves, or can be supplied from water boats.

Ample stocks of coal and fuel oil are maintained.

Repairs can be effected, and divers are available; there are some sheer-legs in the port, the largest of which is capable of lifting weights up to 100 tons. Tugs, lighters, and floating cranes are also available. There are two floating docks; for details of the larger, see Appendix II.

For radio communication, see page 21.

Climatic table.—See page 54.

25 *Chart 822.*

COAST.—Dangers.—Rocher de l'Aiguille is a conical rock about one mile north-eastward of Cap de l'Aiguille. It is 158 feet (48^m1) high, and is joined to the coast by a reef. Northward of this rock the depths are uneven; about 3½ cables east-north-eastward of it there is a 27-foot (8^m2) patch, and about 7 cables north-eastward of it lies a rocky shoal with a depth of 39 feet (11^m9). See view facing page 279.

Cap Ferrat (*Lat. 35° 55' N., Long. 0° 23' W.*), about 4½ miles east-north-eastward of Rocher de l'Aiguille, is rocky and 705 feet (215^m0) high; a hill, also called Cap Ferrat, attains an elevation of 1,306 feet (398^m1) about 1½ miles south-south-westward of the cape. From Cap Ferrat, the coast trends about 2½ miles eastward to Cap Carbon, and is fringed with rocks extending as much as 3 cables offshore.

Cap Carbon, 463 feet (141^m1) high, is the north-eastern extremity of a hilly promontory of which Cap Ferrat is the western extremity. It rises to a rocky rounded hill which, from a distance north-westward, appears detached. The cape is fringed with rocks, and shoals extending about half a mile north-eastward of it. Tunny nets, see page 27, are laid out annually within one mile south-eastward of Cap Carbon. On this cape stands a disused signal and radio station; on the summit above it is a radar installation.

Charts 822, 2437.

Golfe d'Arzew.—Caution.—This bight, see view C on chart 2437, is entered between Cap Carbon and Cap Ivi, about 30 miles east-north-eastward. On its western side is the town of Arzew, at its head is Port-aux-Poules, and on its eastern side is Mostaganem.

A hill named Arzew attains an elevation of 738 feet (224^m9), about 3 miles southward of Cap Carbon.

The shores of the gulf being in most places low and the hills being at

Charts 1766, 2717, 2158a.

Charts 822, 2437.

some distance inland, caution is necessary at night or in thick weather, for the land appears to be much farther off than in reality it is.

A slight west-going current usually sets along the shore of the gulf, and flows eastward out of the bay at Arzew. 5

Prohibited anchorage.—Anchorage is prohibited in an area in the western part of Golfe d'Arzew, the limits of which are indicated by pecked lines on the charts.

Chart 837.

Arzew and approaches. — Dangers. — Lights. — Buoyage. — 10
Îlot d'Arzew is the south-easternmost of a group of islets lying within 2 cables of the coast about 3 miles south-eastward of Cap Carbon, *see* chart 822. This islet should not be approached within half a mile, for the group is fringed with rocks and shoals, the outermost of which has a depth of 27 feet (4^m3), rock, and lies about 2 cables east-north-eastward 15 of Îlot d'Arzew.

A light is exhibited, at an elevation of 66 feet (20^m1), from a circular tower on a white building, 39 feet (11^m9) in height, situated on Îlot d'Arzew (*Lat.* 35° 53' N., *Long.* 0° 17' W.).

Banc des Trois Doigts, with a depth of 14 feet (4^m3), rock, lies about 20 2 cables offshore, 6 cables southward of Îlot d'Arzew. Tunny nets *see* page 27, are laid out annually between this shoal and the islet.

Banc de la Madrague, with depths of 33 feet (10^m1) in two places, lies within 6 cables of the shore about 9 cables southward of Îlot d'Arzew. 25

Two yellow buoys, about half a cable apart, the western buoy can-shaped and the eastern buoy spherical, are moored on Banc de la Madrague, about one mile south-south-eastward of Îlot d'Arzew.

Banc de Tourville, with a depth of less than 18 feet (5^m5), extends about 2½ cables offshore 8 cables south-south-westward of Fort de la 30 Pointe, *see* below.

Rocher Damesne lies about three-quarters of a cable offshore 1½ miles southward of Fort de la Pointe.

Fort de la Pointe is situated about 8½ cables south-south-westward of Îlot d'Arzew and Jetée Abri extends about 1½ cables from the shore 35 abreast it.

A light is exhibited, at an elevation of 27 feet (8^m2), from an iron column, 20 feet (6^m1) in height, situated on the head of Jetée Abri.

The harbour is protected on its eastern side by Grand Quai and Jetée Est, which, together, extend about 3½ cables southward, from 40 a position about one cable westward of the root of Jetée Abri, and on the southern side by Jetée Sud, which extends about 4 cables eastward, from a position about 5½ cables westward of the head of Jetée Est. The entrance between the heads of Jetée Est and Jetée Sud is about 1½ cables wide and faces southward. Môle No. 3 extends about 45 1½ cables southward, from a position about 1½ cables westward of the root of Grand Quai; farther westward are two landing places, Môle No. 2 and Môle No. 1.

There are general depths in the harbour of from 18 to 30 feet (5^m5 to 9^m1), and depths of from 36 to 42 feet (11^m0 to 12^m8) in the entrance. 50 There are depths of from 22 to 28 feet (6^m7 to 8^m5) alongside the eastern side and head of Môle No. 3.

A conical light-buoy, painted black and exhibiting a *green fixed* light, is moored close southward of Jetée Est. A can light-buoy,

Charts 1766, 2717, 2158a.

Chart 837.

painted red and exhibiting a *red fixed* light, is moored close south-eastward of the head of Jetée Sud.

The town of Arzew, on the shore westward of the above-mentioned
5 landing places, had a population, in 1948, of about 7,500. The town is not visible from the offing.

Obstruction.—Buoy.—An obstruction, with a depth of 23 feet (7^m0), which is marked by a small buoy, is situated about one mile south-south-westward of the head of Jetée Abri.

10 **Anchorage.—Pilotage.**—The roadstead at Arzew is sheltered from northerly winds as far eastward as north-north-east, but heavy seas are sometimes experienced, especially with northerly and north-westerly winds.

Anchorage can be obtained, in a depth of 42 feet (12^m8), clear of the
15 entrance, about 2½ cables south-south-westward of Fort de la Pointe, with the belfry in the middle of the town bearing 280°, distant about 4½ cables. The holding ground is good, and the bottom is of sand and weed, but there are some rocky patches which must be avoided. Vessels intending to remain for any length of time usually moor with
20 the anchors north-westward and south-eastward.

Pilotage is compulsory in the area southward of the parallel of the lighthouse on Îlot d'Arzew, and westward of the meridian of the belfry at Saint Leu, *see* below.

Prohibited anchorage.—Anchorage is prohibited in an area, the
25 southern limit of which is indicated by a pecked line on the chart, north-eastward of Arzew.

Port facilities.—Water is laid on to the quays. Small stocks of coal and fuel oil are maintained. A 6-ton sheer-legs and a 5-ton crane are available. There is a patent slip.

30 There is a small hospital at Arzew.

Chart 2437.

Coast.—Dangers.—From Arzew, the southern shore of Golfe d'Arzew trends about 8 miles east-south-eastward to Port-aux-Poules. Near the middle of this stretch of coast and a short distance inland is
35 the white belfry of Saint Leu. Tunny nets, *see* page 27, are laid out annually northward of Saint Leu.

Port-aux-Poules is only a slight indentation in the coast; it affords no shelter, and is only visited by a few small coasting vessels. About 8 cables westward of it, and within 3 cables of the coast, is a rocky
40 shoal with a depth of 1½ fathoms (2^m3).

Plage de Macta extends about 3 miles eastward from Port-aux-Poules to Cap Rouge (*Lat.* 35° 48' N., *Long.* 0° 06' W.).

Cap Rouge is a rocky point dominated by the white shrine of Sidi-Mansour. On the south-westernmost of the hills south-eastward of
45 this cape, at an elevation of 470 feet (143^m3), is a disused signal station. Tunny nets, *see* page 27, are laid out annually off the coast north-eastward of the cape.

From Cap Rouge, the coast trends about 11 miles north-eastward to Pointe de la Salamandre, and consists of cliffs, interrupted near the
50 middle by a beach fronting the village of Georges Clemenceau (La Stidia). There is another beach about 2½ miles south-westward of Pointe de la Salamandre, about three-quarters of a mile inland of which, at an elevation of 630 feet (192^m0), stands a ruined signal station.

Charts 822, 1766, 2717, 2158a.

Chart 2437.

Detached shoals, with depths of from one to $4\frac{1}{2}$ fathoms (1^m8 to 7^m8), lie within half a mile of the shore for about $2\frac{3}{4}$ miles north-eastward of Cap Rouge.

Chart 1766, plan of Mostaganem.

Mostaganem. — Dangers. — Light-buoy. — Lights. — Pointe de la Salamandre lies about one mile south-westward of the entrance of the harbour at Mostaganem, and on it are some buildings. A spit, with depths of less than 3 fathoms (5^m5), extends about 2 cables north-westward of the point.

The town of Mostaganem had a population, in 1948, of about 50,000. Its white buildings show up well against the grey, hilly background.

The harbour is protected by two moles, the entrance between which faces south-westward and is about 130 yards (118^m9) wide. In 1949 the greater part of the harbour was dredged to a depth of 26 feet (7^m9), and vessels 410 feet (125^m0) in length could be accommodated.

The northern mole extends about $3\frac{1}{2}$ cables south-westward from the entrance; a can light-buoy, painted red, surmounted by a cylinder and exhibiting a *red fixed* light, is moored half a cable south-westward of its head. Vessels must pass south-westward of this light-buoy. In 1949, harbour extension works were in progress.

The northern mole extends about $3\frac{1}{2}$ cables south-westward from the entrance, and there is a can light-buoy, painted red and exhibiting a *red fixed* light, moored about half a cable south-westward of its head; vessels must pass south-westward of this light-buoy. In 1949, further extensive works were in progress.

A light is exhibited, at an elevation of 50 feet (15^m2), from an iron tower, 25 feet (7^m6) in height, situated about $2\frac{3}{4}$ cables within the head of the northern jetty.

A light is exhibited, at an elevation of 38 feet (11^m6), from an iron turret, 11 feet (3^m4) in height, situated on the head of the southern jetty.

A light is exhibited, at an elevation of 38 feet (11^m6), from an iron turret, 10 feet (3^m0) in height, situated on the head of a short spur extending south-eastward from the northern jetty.

Two lights, disposed horizontally, and more brilliant than any of the foregoing, are usually exhibited on the northern side of the electricity generating station at Mostaganem.

Anchorage.—The roadstead off Mostaganem is completely exposed, and winds from between west and north render it dangerous.

Anchorage can be obtained, in a depth of 14 fathoms (25^m6), about $6\frac{1}{2}$ cables westward of the entrance of the harbour; the bottom is mud covered with sand, but there are some rocky patches which must be avoided.

Chart 2437.

Prohibited anchorage.—Anchorage is prohibited in an area off Mostaganem (*Lat. $35^{\circ} 56' N.$, Long. $0^{\circ} 05' E.$*), the limits of which are indicated by pecked lines on the chart.

Chart 1766, plan of Mostaganem.

Pilotage.—Pilotage is compulsory in an area bounded westward by the meridian of Pointe de la Salamandre and northward by the meridian of Pointe de Karouba, *see* below.

Port facilities.—Water is laid on to the northern mole or can be

Chart 2158a.

Chart 1766, plan of Mostaganem.

supplied by water-boat. A moderate stock of coal is maintained. Cranes up to 6 tons capacity are available.

Chart 2437.

- 5 **Coast.—Danger.**—Pointe de Karouba (Karuba) lies about $1\frac{1}{4}$ miles north-north-eastward of the harbour of Mostaganem and on its southern side lies Anse des Pirates.

Oued Cheliff (Shelif) flows into the sea, through a remarkable ravine, about $4\frac{1}{2}$ miles northward of Pointe de Karouba. From westward,
10 a prominent detached conical hill appears in the ravine about one mile inland. The river is spanned by an iron bridge about half a mile from its mouth, and on its northern bank is a noticeable building. A low point, formed by the alluvium of the river, extends seaward from the high land on either side of the ravine; this point is growing seaward,
15 and should be given a wide berth.

Djebel Chaibia (*Lat.* $36^{\circ} 03' N.$, *Long.* $0^{\circ} 10' E.$) is a conical hill, 682 feet (207^m9) high, about 2 miles north-eastward of the mouth of Oued Cheliff. It extends about half a mile inland and is backed by higher hills from which it is detached.

- 20 *Charts 1909 and 2437.*

Cap Ivi.—Dangers.—Light.—This cape, about $4\frac{1}{2}$ miles north-eastward of Djebel Chaibia, is backed by mountains, and is not a prominent mark, *see* view D on chart 2437 and facing page 279. From south-westward and north-eastward, it appears as a plateau, 65 feet
25 (19^m8) high, falling steeply to the sea, and surmounted by a hillock on which is a lighthouse, but this latter is not easily made out. A short distance westward of the cape there is a large white sandhill, on which is a patch of dark verdure about 100 feet (30^m5) high.

Djebel Korima rises to an elevation of 965 feet (294^m1) about
30 $1\frac{1}{2}$ miles south-eastward of the cape; on its summit stands a prominent, reddish watch tower, and on its north-eastern slope there is a village.

Kef el Eurcher, about 7 cables south-westward of Cap Ivi, is fringed with rocks extending about 3 cables offshore. About 5 cables south-westward of Kef el Eurcher is a point fringed with rocks extending
35 about half a mile offshore; the outermost rock has a depth of less than 6 feet (1^m8).

A light is exhibited, at an elevation of 389 feet (118^m6), from an octagonal tower surmounting a white building, 61 feet (18^m6) in height, situated on Cap Ivi.

- 40 *Chart 1909.*

Coast.—Dangers.—Port de Bosquet (*Lat.* $36^{\circ} 09' N.$, *Long.* $0^{\circ} 18' E.$), about $4\frac{1}{2}$ miles north-eastward of Cap Ivi, is fringed with rocks. It is available only for small craft with local knowledge; the shelter it affords is bad; there is a landing place.

- 45 Baie Teddert is a slight indentation between Port de Bosquet and Kef-el-Asfer, about 3 miles north-eastward.

Kef-el-Asfer is a low point that is dangerous at night or in thick weather, for a vessel may be deceived by the loom of the hills behind it, which are some distance inland.

- 50 Pointe d'El Aoua (Aua) is bare and rocky; it lies about $2\frac{1}{2}$ miles east-north-eastward of Kef-el-Asfer, and close eastward of it there is a landing place abreast a small village. At times strong currents are experienced off this point.

Oued Kaddous (Wadi Caddas) lies about $10\frac{1}{2}$ miles east-north-

Chart 2158a.

Chart 1909.

eastward of Pointe d'El Aoua, and about midway between them a group of white buildings surmounts a rocky cliff about 50 feet (15^m2) high. Oued Kaddous is easily identified from northward, and on its eastern side there is a conical hill, 384 feet (117^m0) high, surmounted 5 by a building.

Oued Kramis, about 3 miles north-eastward of Oued Kaddous, is open westward; it is easily identified from westward or north-westward by some large yellow sandhills near it. On its northern side, just below the crest of the hills stands a building. 10

Cap Kramis, about one mile north-eastward of Oued Kramis, is faced with steep cliffs, which show up red when the setting sun shines on them. The western side of the cape is fringed with shoals, which, with depths of less than 3 fathoms (5^m5), extend about 3 cables offshore.

Srim, Tacheta (Tasheta) and Allouda (Alluda), from 5½ to 9 miles 15 south-eastward of Cap Kramis, are prominent mountains, which, when seen from between west-north-westward and north-north-westward, appear as a saddle-shaped group, from 2,552 to 2,694 feet (777^m1 to 821^m1) high.

Cap Magroua (Magrowa) is a rounded hillock about 8 miles east- 20 north-eastward of Cap Kramis, and one mile inland, about 2½ miles south-south-westward of it, Djebel Tamiste rises to an elevation of 1,460 feet (445^m0) by gentle slopes.

Îlot Colombi, 92 feet (28^m0) high, lies 3 cables offshore, about 7 miles north-eastward of Cap Magroua. From abreast the islet, the coast 25 trends about 13½ miles east-north-eastward to Cap Kalah (*Lat.* 36° 31' N., *Long.* 1° 11' E.), and is fringed with rocks.

Pointe Rouge, close eastward of which is a bay named El Mersa, is about 9½ miles east-north-eastward of Îlot Colombi, and about half a mile northward of it is a detached 5½-fathom (10^m1) patch. Landing 30 can be effected in a cove between Pointe Rouge and El Mersa, but it is exposed to northerly winds.

Cap Kalah has a rock, 20 feet (6^m1) high, lying about one-quarter of a mile northward of it. Djebel Bou Messaoud (Bu Mesaoud) attains an elevation of 2,451 feet (747^m1), about 3 miles south-south-westward 35 of the cape. From Cap Kalah the rocky coast trends about 8 miles east-north-eastward to Cap Ténès, but all known dangers lie within half a mile of it.

Anchorage.—Small vessels with local knowledge can anchor in El Mersa, or in Baie des Maïnīs, about 2 miles eastward of Cap Kalah, 40 but only during offshore winds.

Chart 3301.

Ténès and approaches. — **Dangers.** — **Lights.** — **Buoys** — The harbour of Ténès lies about 1½ miles south-westward of the western extremity of Cap Ténès and between, the cliffy coast is backed by a 45 ridge, which attains, at Djebel Ach Zerfet or Pic du Port, an elevation of 1,181 feet (360^m0). On the south-western jetty of this harbour there is a conspicuous, white, polygonal silo, 154 feet (46^m9) high.

Cap Ténès, *see* chart 1909 and views on chart 1909 and facing pages 284 and 285, extends about 2 miles eastward from its western 50 extremity. It is rocky and is dominated by Sidi Mérouane (Meruane), which rises to an elevation of 2,175 feet (662^m9). A grey watch tower stands, at an elevation of 2,093 feet (637^m9), a short distance westward of the summit. From westward or eastward, the cape appears, at a

Charts 1766, 2158a.

Chart 3301.

distance, steep-sided with a rounded top surmounted by a sharp peak ; from northward it appears lower than in reality it is. Some large rocks lie within one cable of the northern side of the cape.

- 5 A light is exhibited, at an elevation of 292 feet (89^m0), from a white square tower, 52 feet (15^m8) in height, attached to a dwelling, situated near the western extremity of Cape Ténès. There is a signal station close east-south-eastward of the lighthouse.

- Écueil de l'Etna, with a depth of 6 feet (1^m8), lies about 1½ cables north-north-westward of the lighthouse at Cape Ténès, and about one cable west-north-westward of it is a detached 3½-fathom (6^m9) patch. A vessel should not approach within 3 cables of the point on which stands the lighthouse.

- 15 Shoals, with depths of less than 3 fathoms (5^m5), lie within 1½ cables of the coast between the western extremity of Cape Ténès and the harbour.

- The harbour at Ténès consists of a northern and a south-western jetty ; the entrance between their heads faces north-north-westward and is about three-quarters of a cable wide. Across this entrance, 20 and at a distance of about half a cable from the heads of the jetties, is a detached breakwater. The harbour is available to vessels 393 feet (119^m8) in length, and drawing 21 feet (6^m4) ; but in heavy weather entry is dangerous. Entry can be effected at either end of the detached breakwater, but the western entrance is to be preferred ; in either 25 case a vessel should keep in mid-channel. Vessels can secure alongside the south-western jetty in depths of from 13 to 24 feet (4^m0 to 7^m3). There is a small pier in the southern corner of the harbour with a depth of 13 feet (4^m0) at its head.

- A light (*Lat.* 36° 32' N., *Long.* 1° 19' E.) is exhibited, at an elevation 30 of 48 feet (14^m6), from an iron structure on a white base, 21 feet (6^m4) in height, situated on the north-western corner of the south-western jetty.

- A light is exhibited, at an elevation of 24 feet (7^m3), from a green support on a white base, 15 feet (4^m6) in height, situated on the head 35 of the south-western jetty.

These two lights, in line, bearing 230°, lead through the eastern entrance, but do not clear the shoals north-eastward of the harbour.

- A light is exhibited, at an elevation of 24 feet (7^m3), from a red support on a white base, 15 feet (4^m6) in height, situated on the head 40 of the north-eastern jetty.

A light is exhibited, at an elevation of 52 feet (15^m8), from an iron structure on a white base, 16 feet (4^m9) in height, situated about three-quarters of a cable north-eastward of the root of the north-eastern jetty.

- 45 These two lights in line, bearing about 087°, lead through the western entrance to the harbour.

A black buoy, surmounted by a cylinder, is moored close south-westward of the western end of the detached breakwater ; a similar buoy is moored close westward of the head of the north-eastern jetty.

- 50 The town of Ténès (*Lat.* 36° 31' N., *Long.* 1° 19' E.), which, in 1948, had a population of about 5,200, is situated about one mile south-westward of the harbour.

- Anchorage.—Directions.**—The roadstead at Ténès is exposed from between west and north, and the sea breaks at a considerable 55 distance offshore.

Charts 1909, 1766, 2158a,

Chart 3301.

Anchorage can be obtained, in summer, about $4\frac{1}{2}$ cables northward or north-north-westward of the Port office, situated in the middle of the northern side of the town, in depths of 8 or 9 fathoms (14^m6 or 16^m5), good holding ground of muddy sand. In winter, it is advisable to anchor farther north-westward. Vessels intending to stay for any length of time usually moor, as land and sea breezes prevail, and when swinging to a single anchor, it is liable to become fouled. 5

Caution is necessary when entering the harbour by the western entrance during strong north-westerly winds to avoid being set down 10 on to the south-western jetty. Pic du Port in line with the eastern extremity of the detached breakwater, bearing 070° , will keep a vessel well to windward.

The eastern entrance is suitable for small craft only.

Vessels in the harbour should be ready to let go a second anchor and 15 to veer the cable of the first, for heavy squalls sometimes descend from the mountains, during easterly winds.

Life-saving.—Life-saving appliances are maintained at Ténès, see page 15.

Port facilities.—Provisions are scarce. Water is laid on to the 20 south-western jetty, which jetty is connected with the railway system. A small stock of coal is maintained.

Chart 1909.

Coast.—Dangers.—Kef Arend is the eastern extremity of Cap Ténès, and within three-quarters of a cable of its eastern side lies 25 Écueil du Phoque, with a depth of 6 feet (1^m8).

Baie de Terarenia lies on the eastern side of Cap Ténès, and about 2 miles southward of its eastern entrance point, Tazanount (Taznunt) rises to an elevation of 2,579 feet (786^m1), and is a prominent feature. Oued Bou Yacoub (Wad Bu Yacub) flows into the southern part of 30 the bay.

Écueil du Maure, with a depth of less than 6 feet (1^m8), lies 3 cables offshore about $1\frac{1}{2}$ miles east-south-eastward of Kef Arend.

Pointe Kef-es-Souari (*Lat. $36^\circ 32' N.$, Long. $1^\circ 28' E.$*) is 200 feet (61^m0) high, and lies about 4 miles eastward of Kef Arend. This point 35 is fringed by a reef extending about $1\frac{1}{2}$ cables offshore.

Suhalia, a conical mountain 1,007 feet (306^m9) high, is situated close south-westward of Kef-es-Suari.

Djebel Bissa (Tames Guida) rises to an elevation of 3,796 feet ($1,157^m0$) about 5 miles southward of Kef-es-Souari; it dominates 40 this stretch of coast. It is a prominent mark from the offing, but cannot be seen from close inshore.

Kef-el-Hauaci is a small peninsula about $2\frac{1}{2}$ miles eastward of Kef-es-Souari, and between them lies Baie Suhalia. Above-water and sunken rocks extend about 2 cables northward of the peninsula. 45 In the eastern side of the peninsula there is a small creek where boats can obtain shelter from westerly or northerly winds.

Pointe Abd-el-Kader rises, about $1\frac{1}{2}$ miles eastward of Kef-el-Hauaci, to a hill about 900 feet (274^m3) high. The western slope of this hill forms a point, through which, from north-eastward to south- 50 westward, runs a tunnel.

Baie des Beni Haoua (Hausas) is entered between Pointe Abd-el-Kader and Îlot Sidi Djilani about $1\frac{1}{2}$ miles eastward, and at its head stands the village of Francis Garnier.

Charts 1766, 2158a.

Chart 1909.

Anchorage.—Baie de Terarenia affords shelter from westerly winds to vessels with local knowledge. Anchorage can be obtained, in depths of from $4\frac{1}{2}$ to $6\frac{1}{2}$ fathoms (7^m8 to 11^m9), sand, about $2\frac{1}{2}$ cables from the head of the bay, with Kef-el-Hauaci in line with the extremity of the land near Kef-es-Souari, bearing about 090° , and Kef Arend, bearing about 326° . There are some rocks near the beach and also about one cable offshore in the vicinity of the mouth of Oued Bou Yacoub.

Port Breira.—This port is situated under the lee of Îlot Sidi Djilani, which is joined to the mainland by a footbridge. This port is visited by small coasting vessels to load ore, and affords shelter from easterly winds. There are three mooring buoys in Port Breira.

Coast.—Dangers.—Cap Semada lies about $1\frac{1}{2}$ miles east-north-eastward of Port Breira, and about $1\frac{1}{2}$ miles south-south-eastward of it, Bou Toul (Bu Tuil) rises to an elevation of 2,041 feet (622^m1), and is a good mark.

Cap Sirat lies about $1\frac{1}{2}$ miles east-north-eastward of Cap Semada, and about $1\frac{1}{2}$ miles farther eastward Rocher Djelali or Djilari, 26 feet (7^m9) high, stands in the middle of a sandy beach.

A rock, awash, lies about 2 cables northward of Rocher Djelali. The summit of Tazanount in line with the summit of the hill above Pointe Abd-el-Kader, bearing 257° , leads about one cable northward of this rock.

Oued Damous (Wad Damas) flows into the sea about half a mile eastward of Rocher Djelali, through a remarkable gap in the mountains, which are from 1,600 to 2,000 feet (487^m7 to 609^m6) high.

The village of Duplex is situated about half a mile eastward of the mouth of Oued Damous.

Pointe Imkardou lies about $2\frac{1}{2}$ miles eastward of Duplex, and about 2 miles farther eastward is the village of Villebourg.

A rock, 3 feet (0^m9) high, having a rock, with a depth of 3 feet (0^m9), about one-quarter of a mile westward of it, lies about $1\frac{1}{2}$ cables offshore abreast Villebourg (*Lat. $36^\circ 34' N.$, Long. $1^\circ 48' E.$*).

Cap Larès (Kef-el-Arer) lies about $2\frac{1}{2}$ miles east-north-eastward of Villebourg, and about one-quarter of a mile farther eastward is the shrine of Sidi Brahim-El-Krouas.

Îlot Tokikt-Indich or De la Fourmi (Ashak), flat-topped, rocky, steep-to and 10 feet (3^m0) high, lies about $1\frac{1}{2}$ miles north-north-westward of Cap Larès. There is a $6\frac{1}{2}$ -fathom (11^m9) rocky patch about 4 cables west-north-westward of the islet. This islet should be given a wide berth in thick weather.

Gouraya (Guraya), a village on the coast about $2\frac{1}{2}$ miles eastward of Cap Larès, is easily identified by its white houses which show up against a green background. There is a small jetty at the village, half a mile northward of which is a rock with a depth over it of $3\frac{1}{2}$ fathoms (5^m9); other rocks lie within $1\frac{1}{2}$ cables north-westward, northward, and north-eastward of the jetty. About 4 miles southward of the village, Djebel Gouraya rises to an elevation of 3,271 feet (997^m0).

Pointe Taska, half a mile eastward of the village of Gouraya, ends in low cliffs, and on it stand some ruins. A reef fringes this point, extending a short distance offshore.

Pointe Addala Mellel (Ras-el-Terf) lies about half a mile east-south-eastward of Pointe Taska, and from it a beach extends about 4 miles eastward.

Charts 1766, 2158a.

Chart 1909.

Fontaine du Génie (Grani) is a village situated, about 6 miles eastward of Pointe Addala Mellel, at the foot of Taourira (Taurira), a detached conical hill 1,762 feet (537^m1) high.

Îlot de Taourira (Taurira) is a round-backed islet, 33 feet (10^m1) high, situated about half a mile offshore, northward of Fontaine du Génie. 5

Pointe des Oliviers lies about 2½ miles eastward of Fontaine du Génie, and about one mile farther eastward is the village of Novi, which shows up well from seaward. From Novi the coast trends about 10 3½ miles east-north-eastward to Chercshell (Shershel).

Anchorage.—Small vessels, with local knowledge, can obtain anchorage off Villebourg, in fine weather.

Small vessels, with local knowledge, can secure alongside the jetty at Gouraya. 15

Chart 1766, plan of Port Shershel.

Chercshell and approaches.—**Dangers.**—**Lights.**—The small harbour of Chercshell (Shershel) is constructed between Îlot Joinville and the coast southward of it. The town (*Lat.* 36° 37' N., *Long.* 2° 11' E.), which had a population of about 12,000 in 1948, stands 20 on the coast immediately southward of the harbour, and is backed by green hills. See view facing page 285.

The coast immediately westward of Chercshell is fringed by a bank, with depths of less than 3 fathoms (5^m5), on which lie numerous above-water rocks, and which extends as much as 2½ cables offshore. A 25 detached patch, with a depth of 3½ fathoms (6^m4), lies about 1½ miles westward of Îlot Joinville.

A 2-fathom (3^m7) rocky patch lies about 3 cables westward, and a 4½-fathom rocky patch lies about one cable northward of Îlot Joinville.

Pointe Tizirine (Zizirin) is the extremity of a small peninsula, 65 feet 30 (19^m8) high, which lies about 6 cables east-north-eastward of Îlot Joinville, and between them the coast is fringed by a shoal bank on which lie numerous rocks, awash, and Écueil du Grand Hammam. A rock, with a depth of less than 6 feet (1^m8), lies about half a cable northward of Pointe Tizirine. 35

A beacon, consisting of a small black tower with a white band, surmounted by two cones, points up, stands on Écueil du Grand Hammam, about 2 cables north-eastward of Îlot Joinville.

A light is exhibited, at an elevation of 122 feet (37^m2), from a stone tower, 79 feet (24^m1) in height, situated on the summit of Îlot Joinville. 40

A light is exhibited, at an elevation of 33 feet (10^m1), from a white concrete column, 14 feet (4^m3) in height, situated on the head of a mole extending about half a cable east-north-eastward from the north-eastern extremity of Îlot Joinville. Several sunken blocks of masonry lie near this mole. 45

There are depths of from 1½ to 2 fathoms (2^m7 to 3^m7) in the harbour, the entrance to which, between the heads of Quai Nord and Jetée Est, is 72 feet (21^m9) wide.

Two lights are exhibited, at elevations of 25 feet (7^m6), each from a white column, 12 feet (3^m7) in height, situated one on either side of 50 the entrance to the harbour.

Anchorage.—**Directions.**—The anchorage in the roadstead off Chercshell is very bad; it is entirely exposed, and even moderate breezes raise a heavy sea.

Chart 1766, plan of Port Shershel.

Anchorage can be obtained, in summer, in a depth of 8 fathoms (14^m6), sand, west-north-westward of Point Tizirine; but great care must be taken for the bottom is rocky in many places. In winter, 5 vessels should anchor farther offshore, and be ready to leave at the slightest sign of bad weather.

Vessels should not anchor northward of Îlot Joinville, as the bottom is rocky and the holding ground is bad.

The harbour can neither be entered nor left in bad weather. By 10 day, a vessel entering should steer for a ruined fort, in the middle of the northern side of the town, bearing about 185°, to pass between Écueil du Grand Hammam and the mole extending from Îlot Joinville; the former should be given a berth of not less than one-quarter of a cable, and the head of the latter should be passed at a distance of 15 about 200 feet (61^m0). At night, the light at the head of the mole in line with that on the northern side of the entrance of the harbour, bearing about 202°, leads towards the harbour clear of all dangers.

Life-saving.—Life-saving appliances are maintained at Cherchell; see page 15.

20 **Port facilities.**—Water is laid on to the quay. There is a hospital. *Chart 1909.*

Coast.—Dangers.—Between Cherchell and Tipasa, about 12½ miles eastward, the coast forms a rounded promontory, which rises to a prominent range of mountains, named Chenoua (Shenua), that attains 25 an elevation of 2,969 feet (904^m9).

Cap Blanc (*Lat.* 36° 37' N., *Long.* 2° 15' E.) lies about 1½ miles east-north-eastward of Pointe Tizirine, and is faced with yellow cliffs.

Ras El Amesfout lies about 1½ miles east-north-eastward of Cap 30 Blanc, and within one-quarter of a mile westward and north-westward of it, there are some islets.

Écueil du Sphinx, with a depth of 6 feet (1^m8), lies at the northern end of a rocky spit extending northward from the coast to a position about 1½ miles north-eastward of Ras El Amesfout. The lighthouse on 35 Îlot Joinville in line with the belfry at Novi, bearing about 242°, or in line with the summit of Taourira, bearing about 245°, leads, respectively, about half a mile and one-quarter of a mile north-north-westward of this danger.

Pointe Berinshel lies about 4½ miles east-north-eastward of Ras El 40 Amesfout, and about 2 cables north-westward of it lies the rocky Îlot Berinshel, which is 66 feet (20^m1) high and is surrounded by rocks extending about one-quarter of a mile. Between Écueil du Sphinx and Îlot Berinshel are several other dangerous rocks, the outermost of which has a depth of 2 fathoms (3^m7) and lies about three-quarters of 45 a mile west-north-westward of the islet.

Ras El-Amouch (Amuch) lies about 2½ miles east-south-eastward of Pointe Berinshel, and on a hill above it, at an elevation of 518 feet (157^m9), is a disused signal station. About midway between the two 50 points are two low rocky islets, surrounded by rocks, within 2 cables of the coast. A detached 3½-fathom (5^m9) patch lies about half a mile east-north-eastward of these islets.

Pointe Chenoua lies about half a mile south-south-eastward of Ras El-Amouch, and on it is a factory.

Anse des Carrières is entered between Ras El-Amouch and Pointe

Charts 160, 2158a.

Chart 1909.

Chenoua. Its shores are fringed with rocks in places, and on its southern side stands a large building.

Anse des Grottes is a small open bay southward of Pointe Chenoua. Rocks extend about three-quarters of a cable from the shores of this bay in places. 5

Anchorages.—Small vessels, with local knowledge, can obtain anchorage in Anse des Carrières, in a depth of about 5 fathoms (9^m1), sand and rocky patches, about three-quarters of a cable offshore.

Small vessels, with local knowledge, can obtain anchorage, sheltered from westerly winds, in Anse des Grottes, in depths of from 6½ to 9 fathoms (11^m9 to 16^m5), sand, about 2½ cables offshore. 10

Chart 1766, plan of Port Tipaza.

Tipasa and approaches.—**Dangers.**—**Lights.**—The harbour at Tipasa is exposed to winds from north-west, through north, to east, and the shelter it affords from westerly winds is poor. 15

The town, which had, in 1948, a population of about 4,300, affords few facilities.

Ras el Kalia (*Lat.* 36° 36' N., *Long.* 2° 26' E.) lies north-north-eastward of the town, and the bay on its western side is foul. 20

A light is exhibited, at an elevation of 105 feet (32^m0), from a white square tower, 108 feet (32^m9) in height, attached to a dwelling situated on Ras el Kalia.

Banc des Romains, with depths of from 4½ to 10 fathoms (7^m8 to 18^m3), rock, lies about 4 cables north-north-eastward of Ras el Kalia. 25

Îlots Sidi Said lie on a shoal spit about half a mile eastward of Ras el Kalia, and are two in number. A bank, with depths of less than 3 fathoms (5^m5), extends as much as 1½ cables, in places, from the shore of the bay between Ras el Kalia and Îlots Sidi Said, and a spit, with depths of less than 5 fathoms (9^m1), extends 1½ cables northward of these islets. 30

A landing mole, on the eastern side of which there is a depth of about 8 feet (2^m4), extends northward from the shore at Tipasa; in summer, even light onshore breezes render landing difficult and sometimes impossible. 35

Leading lights are exhibited, the front light, at an elevation of 21 feet (6^m4), from an iron column, 16 feet (4^m9) in height, situated on the head of the western mole; and the rear light, at an elevation of 33 feet (10^m1), from a post on a wall, 24 feet (7^m3) in height, situated about three-quarters of a cable southward of the front light-structure. These lights in line, bearing 181°, lead to the landing place. 40

A light is exhibited, at an elevation of 37 feet (11^m2), from a grey column, 25 feet (7^m6) in height, situated on the head of the eastern mole.

Life-saving.—Life-saving appliances are maintained at Tipasa. 45
See page 15.

Anchorage.—Vessels can obtain open anchorage, in depths of from 11 to 16 fathoms (20^m1 to 29^m3), northward of Banc des Romains.

Small vessels can anchor southward of Banc des Romains, in depths of from 6½ to 8 fathoms (11^m9 to 14^m6); in fine weather, they can anchor south-eastward of the lighthouse, in a depth of 4½ fathoms (7^m8), off the custom house. 50

Chart 1909.

Coast. — **Dangers.** — **Light.** — **Prohibited area.** — From

Charts 160, 2158a.

Chart 1909.

Tipasa, the coast trends about $21\frac{1}{2}$ miles east-north-eastward to Sidi Ferruch.

Tombeau de la Chrétienne or Kobr Er Rumaia, surmounting the crest of a range of rocky hills bordering the coast, is a prominent mark situated about 5 miles east-south-eastward of Tipasa. It is a rugged cone, 108 feet (32^m9) in height, the apex of which is at an elevation of 865 feet (263^m5), and at a distance it appears as a large haystack. See view facing page 285.

- 10 Castiglione, about 12 miles eastward of Tipasa, is one of a number of villages near the coast. Small harbours for fishing boats have been constructed at Bou Aroun and Chifalo, about 2 miles and one mile, respectively, south-westward of Castiglione.

Fouka (*Lat. $36^{\circ} 40' N.$, Long. $2^{\circ} 45' E.$*) is another village standing at an elevation of 344 feet (104^m8), about $2\frac{1}{2}$ miles east-north-eastward of Castiglione, and close to the beach below it there is a group of houses. Close westward of Fouka stands a prominent shrine. Oued Mazafran flows into the sea about $3\frac{1}{2}$ miles east-north-eastward of Fouka.

Sidi Ferruch is a small peninsula ; on its south-western side are three islets, and on its north-eastern side is one islet. North-westerly winds give rise to strong currents between Oued Mazafran and Sidi Ferruch.

Pointe Acras (Ras Acrata), $3\frac{1}{2}$ miles north-eastward of Sidi Ferruch, is the western extremity of a large promontory, named Cap Caxine. The point is fringed with rocks, and a shoal bank extends about one-quarter of a mile from it. See view facing page 285.

Guyotville is situated on the coast about one mile eastward of Pointe Acras and at it is a small mole. About midway between Pointe Acras and Guyotville is a coral islet lying about one-quarter of a cable offshore.

A light is exhibited, at an elevation of 23 feet (7^m0), at the head of the mole at Guyotville.

Anchorage.—In fine weather, anchorage can be obtained off the coast between Tipasa and the mouth of Oued Mazafran.

Small vessels, with local knowledge, can obtain anchorage off Guyotville.

35 *Chart 855.*

Coast.—Dangers.—Light.—Radiobeacon.—Cap Caxine lies $2\frac{1}{2}$ miles eastward of Pointe Acras. See view facing page 310.

A light (*Lat. $36^{\circ} 49' N.$, Long. $2^{\circ} 57' E.$*) is exhibited, at an elevation of 210 feet (64^m0), from a white, square tower, 108 feet (32^m9) in height, attached to a dwelling, situated on Cap Caxine. A radiobeacon transmits from this lighthouse.

Pointe Pescade, about 3 miles eastward of the lighthouse, is the northern extremity of the promontory of Cap Caxine ; between the lighthouse and this point the coast is fringed with rocks extending about 2 cables offshore.

Pointe Pescade is a double point ; its western part ends in a flat islet almost joined to the coast, and off its eastern part are two islets with a boat channel between them and the coast. On the eastern part are the ruins of a fort, westward of which is a landing jetty with a depth of 13 feet (4^m0) at its head. From Pointe Pescade the coast trends about $1\frac{1}{4}$ miles south-eastward to the suburb of Sainte Eugène.

The promontory of Cap Caxine is dominated by a range of hills, which attains an elevation of 1,352 feet (312^m9), about $1\frac{1}{2}$ miles southward of Pointe Pescade.

Charts 1766, 160, 2158a.

Chart 855.

Anchorage.—Small vessels, with local knowledge, can obtain anchorage, sheltered from westerly winds, in the lee of Pointe Pescade.

ALGIERS AND APPROACHES.—Algiers, called by the French Alger, stands on the western shore of Baie d'Alger, *see* view A on chart 1910. This bay is entered between Pointe Pescade and Cap Matifou, about 10 mi'es eastward; its shores are, for the most part, a sandy beach.

Approaching from northward, the high land in the vicinity of Cap Caxine (*Lat.* $36^{\circ} 49' N.$, *Long.* $2^{\circ} 57' E.$) appears as if detached from the mainland, for it is separated from the mountains of the interior by the plain of Mitidja; care must be taken, however, to avoid mistaking the heights of Chenoua for it. On nearer approach, Cap Matifou also appears as an island. *See* views facing page 310.

Djebel Mouzaia (Muzaia) and Djebel Mecaud, *see* chart 1766, rise to elevations, respectively, of 5,120 and 4,620 feet (1,560^m6 and 1,408^m2) about 30 miles south-westward and 27 miles south-south-westward of Algiers; between them is a deep gorge which is very remarkable from northward.

Bou Zegza (Bu Zegzag), about 21 miles south-eastward of Algiers and 3,396 feet (1,035^m1) high, may be identified from northward, for its summit is in the form of a small cone rising from a level but irregular crest.

Chart 2555.

Several forts surmount the heights overlooking Algiers, which latter appears as a large white triangle on the slopes of the hills. The church of Notre Dame d'Afrique, at an elevation of 407 feet (124^m0), close southward of Sainte Eugène, is conspicuous. Other prominent objects are the old light-tower on Îlot de la Marine, about $1\frac{1}{2}$ miles south-eastward of the church; the new Government offices on the slopes above the town; two radio masts which, at night, are marked by red lights, situated about half a mile inland, 2 miles south-eastward of Fort l'Empereur; and a gasometer near the shore about $2\frac{1}{2}$ miles south-eastward of Fort l'Empereur.

Coast.—Dangers.—Light.—Beacon.—Pointe des Consuls and Pointe des Anglais are situated at the north-western and south-eastern ends, respectively, of Sainte Eugène. Foul ground extends about 3 cables north-eastward of the former and about $2\frac{1}{2}$ cables northward of the latter.

Pointe el Kettani (*Lat.* $36^{\circ} 40' N.$, *Long.* $3^{\circ} 04' E.$) lies about 7 cables south-eastward of Pointe Anglais, and is fringed with rocks, the outermost of which, Roche M'Tahen, is awash. Near the coast about midway between the two points is a large military hospital.

A stone beacon-tower, 31 feet (9^m4) in height, the upper part painted red and the lower part white, surmounted by two red cones, bases together, stands about 80 yards (73^m1) north-eastward of Roche M'Tahen.

Îlot de la Marine lies about half a mile south-eastward of Pointe el Kettani, and close eastward of its northern end is a small, detached, $2\frac{3}{4}$ -fathom (5^m0), rocky patch.

Chart 855.

The shore of the bay eastward of Algiers is free from off-lying dangers, and the depths decrease regularly towards it.

Charts 1909, 1766, 160, 2158a.

Chart 855.

The church at Kouba (Kuba), about 3 miles south-eastward of the town, has a conspicuous dome.

A light, for the use of aircraft, is exhibited, at an elevation of 404 feet 5 (123^m1), from a red and white framework structure, 98 feet in height, situated about 1½ cables eastward of the dome at Kouba.

Oued El-Harrach flows into the bay about 2 miles eastward of Kouba, at the foot of an isolated hill, about 200 feet (61^m0) high, on the northern slope of which stands the village of Maison-Carrée. There 10 is a large and prominent monastery between this village and the shore.

Fort de l'Eau is a village on the shore about 3 miles eastward of the mouth of Oued El-Harrach, and close southward of it there are some radio masts.

Baie de Matifou is situated on the eastern part of Baie d'Alger, and 15 on its shore, close southward of Cap Matifou, stands the village of La Pérouse, where is the lazaretto. A mole extends south-south-westward from the shore at La Pérouse, and from its eastern side a spur extends south-eastward.

A light is exhibited, at an elevation of 36 feet (11^m0), from a wooden 20 post, situated on the head of the mole at La Pérouse (*Lat.* 36° 48' N., *Long.* 3° 15' E.).

Chart 2555.

Harbour.—The harbour consists of three basins. A diagram indicating the names of the various quays is given on the chart.

25 Vieux port, the northernmost basin, is protected north-eastward by Jetée du Nord, which extends about half a mile south-eastward from Îlot de la Marine. Jetée Pierre-Henry-Watier is the extension south-eastward of Jetée du Nord; in 1950, work was in progress extending this jetty. Îlot de la Marine is connected with the mainland by Jetée 30 Khair ed Din. On its south-eastern side Vieux port is protected by Jetée de l'Est, which extends about 4½ cables north-north-eastward from a position about one mile southward of the old lighthouse on Îlot de la Marine. Môle Amiral Mouchez, on the southern side of Vieux port, extends from the shore towards the southern extremity of Jetée 35 de l'Est. Môle Al Djefna, on the western side of Vieux port, is connected with the railway system; large vessels can moor in Vieux port and secure their sterns to this mole. Môle à Voyageurs, one cable southward of Môle Al Djefna, extends about 1½ cables from the western side of Vieux port. In the northern part of Vieux port there are some 40 jetties, on one of which stands the Health office; in the south-western corner of the basin are the dry docks, *see* Appendix II. There is a coal wharf along the inner side of Jetée de l'Est. There are depths of from 4½ to 11 fathoms (7^m8 to 20^m1) in Vieux port.

Bassin de l'Agha lies between Môle Amiral Mouchez and Grand 45 Môle, about 3 cables southward. It is protected eastward by Jetée de l'Agha, which extends about 3½ cables south-south-eastward from the southern end of Jetée de l'Est. In the middle of the western side of this basin is Môle aux Minerais. There are depths of from 26 to 30 feet (7^m9 to 9^m1) alongside the quays in Bassin de l'Agha.

50 Bassin de Mustapha, the southernmost basin, is protected on its northern side by Jetée Butavand and Jetée de Mustapha which extend eastward for about 3½ cables and then south-eastward for about 2½ cables from the southern end of Jetée de l'Agha; in 1950, Jetée de Mustapha was being extended south-eastward. A spur extends about

Charts 1909, 1910, 1766, 160, 2158a.

Chart 2555.

one cable south-westward from Jetée de Mustapha to a position about $1\frac{1}{2}$ cables north-north-eastward of the head of Brise-Lames Est. Bassin de Mustapha is protected on its eastern side by Brise-Lames Est, extending about $5\frac{1}{2}$ cables northward from the shore, along the western side of which vessels can berth. Quays to a total length of 2,200 feet, with depths of from 23 to 42 feet (7^m0 to 12^m8) alongside, are available in this basin. 5

Westerly winds raise the level of the sea in the basins and easterly winds lower it. The difference in level may amount to as much as 3 feet (0^m9). 10

Considerable swell is experienced at the berths in Vieux port, when a swell is running outside from between north and east.

Lights. — **Fog signal.** — **Buoyage.** — **Pylons.** — A light (*Lat.* $36^{\circ} 47' N.$, *Long.* $3^{\circ} 04' E.$) is exhibited, at an elevation of 49 feet (14^m9), from a white, quadrangular, steel framework tower, 46 feet (14^m0) in height, situated on the head of Jetée Pierre-Henry-Watier. A fog signal is sounded from this lighthouse. 15

A can light-buoy, painted black, surmounted by a triangle, point up, equipped with a radar reflector and exhibiting a *green fixed* light, is moored about $2\frac{1}{2}$ cables south-eastward of the completed part of Jetée Pierre-Henry-Watier and is moved as work progresses; passage north-westward of the light-buoy is prohibited. 20

A light is exhibited, at an elevation of 31 feet (9^m4), from a white tower, 20 feet (6^m1) in height, situated on the head of Musoir du Nord, a spur of Jetée du Nord, on the northern side of the entrance of Vieux port. 25

Two pylons are situated on Musoir du Nord.

A light is exhibited, at an elevation of 31 feet (9^m4), from a white tower, 19 feet (5^m8) in height, situated on the head of Jetée de l'Est, on the southern side of the entrance of Vieux port. 30

Lights are exhibited, one on either side of the passage leading from Vieux port to Bassin de l'Agha.

Lights are exhibited, at elevations of 37 feet (11^m3), one on either side of the southern entrance to Bassin de l'Agha. 35

A light is exhibited, at an elevation of 41 feet (12^m5), from a white iron tower, 29 feet (8^m8) in height, situated on the head of the spur extending from Jetée de Mustapha on the northern side of the entrance to Bassin de Mustapha.

A light is exhibited, at an elevation of 41 feet (12^m5), from a white circular metal turret, 29 feet (8^m8) in height, situated on the head of Brise-Lames Est on the southern side of the entrance to Bassin de Mustapha. 40

A conical light-buoy, painted black, surmounted by a triangle point up, equipped with a radar reflector and exhibiting a *green fixed* light, is moored about 2 cables south-eastward of the head of the completed part of Jetée de Mustapha. 45

Regulations.—**Signals.**—Anchorage is prohibited in the area indicated on the charts by pecked lines extending from Sainte Eugène and Îlot de la Marine on account of submarine telegraph cables, see page 19. 50

Submarine vessels are prohibited from diving within 3 miles of the tower on Îlot de la Marine, see page 11.

Artillery practice is sometimes carried out in the eastern part of Baie

Charts 855, 1909, 1910, 1766, 160, 2158a.

Chart 2555.

d'Alger, in an area the limits of which are indicated on charts 1909 and 1910 by pecked lines.

Quarantine regulations are enforced. Bills of health must be presented at the Health office, and vessels liable to quarantine must not enter the port. The usual quarantine anchorage is off Cap Matifou, *see* below, where there is a lazaretto.

Pilotage, *see* page 20, is compulsory within the area bounded northward by the parallel of Îlot de la Marine, and eastward by the meridian of the church in Hussein Dey, situated about 3 miles south-eastward of Fort l'Empereur. The pilot is embarked off the entrance of Vieux port irrespective of which basin the vessel is bound for. At night the signal for a pilot is the letter "P," of the International Code of Signals, made by flashing lamp.

Merchant vessels can communicate through Bouzaréah Naval signal station on the heights westward of Sainte Eugène. The signal station at the southern end of Jetée de l'Est is available for communication with vessels in the roadstead, when it is not otherwise engaged.

Storm signals, *see* page 12, are shown at the upper yard-arm of the flagstaff at the southern end of Jetée de l'Est.

Signals regulating the entry and departure of vessels, *see* page 14, are displayed at the main yard-arm of the flagstaff at the southern end of Jetée de l'Est. When these signals refer to the northern entrance only, by day a black cylinder is displayed, and at night four *red fixed* lights in the form of a square are exhibited above the main yard-arm. When these signals refer to the southern entrance only, by day a red cone is displayed, and at night three *green fixed* lights in the form of a triangle are exhibited above the main yard-arm. Special signals, shown above and to the right of the foregoing signals, refer to vessels enjoying priority.

Other special regulations are in force in the port, the nature of which should be ascertained on arrival; the most important are as follows:—

The use of the siren, whistle, etc., is forbidden, except in special circumstances.

No vessel may refuse to accept a hawser, or to slack off the warps securing the vessel, when required to do so to assist the movements of another vessel.

Vessels carrying explosives and dangerous materials must show by day a red flag, and at night a *red* light, at the mast-head.

Anchorages.—Directions.—Open anchorage can be obtained as convenient off the port southward of an imaginary line joining Îlot de la Marine (*Lat.* 36° 47' N., *Long.* 3° 04' E.) and a position about 1½ miles north-westward of Fort de l'Eau. The holding ground is good and the depths decrease regularly towards the shore.

The approach to the anchorage is easy. A vessel approaching from westward should give Pointe des Consuls, Pointe des Anglais and Roche M'Taken a wide berth.

Good anchorage can be obtained in Baie de Matifou, *see* chart 855, in depths of from 6 to 9 fathoms (11^m0 to 16^m5), south-westward of Cap Matifou; care must be taken to avoid the prohibited area described below.

A vessel approaching the northern entrance to the harbour should pass southward of the light-buoy marking the extension of Jetée Pierre-Henry-Watier.

Charts 855, 1909, 1910, 1766, 160, 2158a.

Chart 2555.

A vessel entering the southern entrance should pass southward of the light-buoy marking the extension of Jetée de Mustapha, and between the heads of Brise-Lames Est and the spur extending from Jetée de Mustapha.

Chart 855.

Prohibited area.—A prohibited area, the limits of which are indicated by pecked lines on the chart, lies south-westward of Cap Matifou.

Charts 2555, 855.

Prohibited anchorage.—Anchorage is prohibited, in the northern and eastern parts of Baie d'Alger, in an area, the limits of which are indicated by pecked lines on the chart.

Anchorage is prohibited in the approach to Vieux port and Bassin de Mustapha; the limits of these areas are indicated by pecked lines on the chart.

Chart 2555.

Town. — Port facilities. — Communications. — Algiers (*Lat. 36° 46' N., Long. 3° 04' E.*), known to the French as Alger, had, in 1948, a population of about 260,000, and is the most important town in the French possessions in Northern Africa; it is the seat of government of Algeria, and is a naval port. Suburbs extend along the western shore of the bay northward and southward of the town. A British Consular officer resides in the town.

There are both civil and military hospitals at Algiers. For de-ratisation, *see* page 22.

Fresh provisions and supplies of all kinds are abundant. Water is laid on to the quays, or can be supplied from tank-vessels.

Large repairs can be effected; for particulars of the largest dry dock, *see* page 486. Sea-going tugs are available. There is an 80-ton floating sheers, and a number of cranes are available, including 80-ton floating derricks and 20-ton fixed cranes.

Large stocks of coal are available, and ample stocks of fuel oil and diesel oil are maintained.

Steamer communication is maintained with all parts. Regular communication is maintained by air between Algiers and Oran, Algiers and Marseille, and Algiers and Brazzaville, in the French Congo.

For radio communication, *see* page 21.

Climatic table.—*See* page 55.

Charts 855, 1909, 1910, 1766, 160, 2158a.

CHAPTER VIII

THE COAST OF AFRICA—CAP MATIFOU TO RAS AJDIR

Chart 855.

CAP MATIFOU.—**Dangers.**—**Light.**—**Radiobeacon.**—Cap Matifou is the western extremity of a low headland, *see* page 305, the northern side of which is cliffy and about $1\frac{1}{4}$ miles long; its eastern
 5 part rises to a flat-topped hillock, which from a distance appears as an island. The village of Jean-Bart stands on the eastern extremity of the headland. *See* views on chart 1910 and facing this page.

A reef extends about 3 cables west-north-westward from Cap Matifou.

10 A detached rocky patch, with a depth of 10 feet (3^m0) and foul ground between it and the coast, lies 3 cables offshore about 6 cables north-eastward of Cap Matifou. Le Rocher, *see* page 311, bearing more than 098° and well open northward of Îles Sandja, leads northward of this patch.

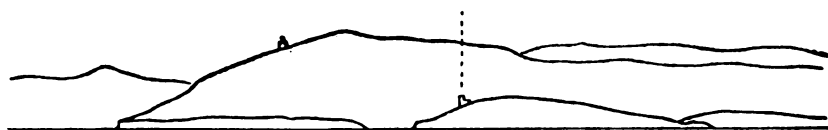
15 Roche de la Source, with a depth of less than 6 feet (1^m8), lies $3\frac{1}{2}$ cables northward of the village of Suffren (Aine-Beida), about one mile east-south-eastward of Cap Matifou. A 13-foot (4^m0) rocky patch lies about one mile eastward of Roche de la Source, and between them and the coast there are several rocks and shoals.

20 A light (*Lat.* $36^\circ 49' N.$, *Long.* $3^\circ 15' E.$) is exhibited, at an elevation of 243 feet (74^m1), from a white, square tower, 36 feet (11^m0) in height, attached to a dwelling, situated close to the middle of the headland of which Cap Matifou is the western extremity. A signal station is situated close north-north-westward of this lighthouse.

25 **Off-lying islets and dangers.**—Banc de Matifou, with a least known depth of 32 feet (9^m8), rock, lies about $2\frac{1}{4}$ miles northward of Cap Matifou. Strong currents are experienced in the vicinity of this shoal, and vessels should avoid passing over it. The summit of Bou Zegza well open westward of Cap Matifou lighthouse, with the latter
 30 bearing less than 142° , leads south-westward of this shoal. This summit open eastward of Îles Sandja, with the latter bearing more than 147° , leads north-eastward of the shoal.

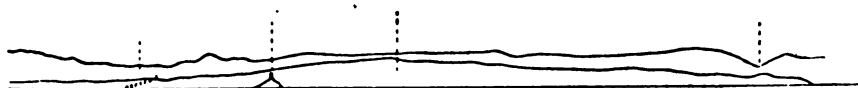
Îles Sandja are a group of rocks lying within half a mile north-eastward of the eastern extremity of the headland of which Cap
 35 Matifou is the western extremity. The largest is 41 feet (12^m5) high. There are rocky patches within one-quarter of a mile eastward and westward of the group, and vessels should not attempt to pass between these rocks and the coast.

Charts 1910, 1766, 160, 2158a.



*Lighthouse, bearing
130°, 11 miles.*

Cap Caxine from north-westward.



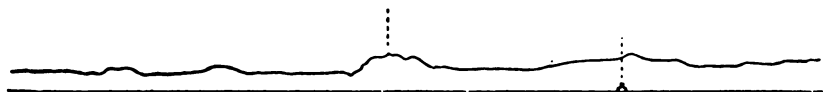
*Algiers,
bearing 185°,
17 miles.*

*Notre Dame
d'Afrique.*

La Bouzaréah.

Gorge.

Approaches to Algiers from northward.



*Djebel
Bou-Zegzag.*

*Cap Matifou,
bearing 150°,
17 miles.*

Cap Matifou from north-north-westward.

(Originals dated 1937.)



*Lighthouse,
bearing 280°,
3 miles.*

*Îles
Sandja.*

Cap Matifou from east-south-eastward.

(Original dated 1906.)

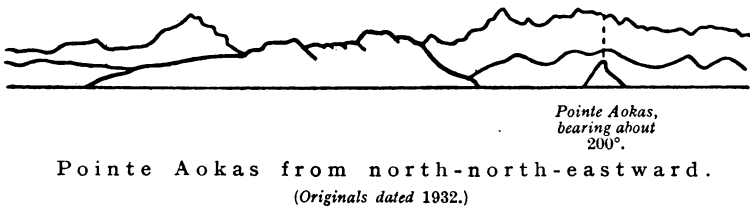
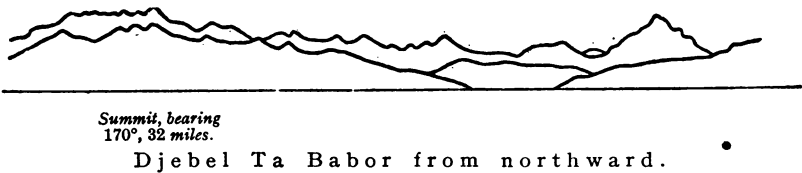
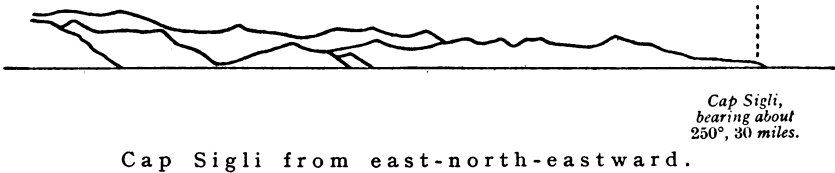
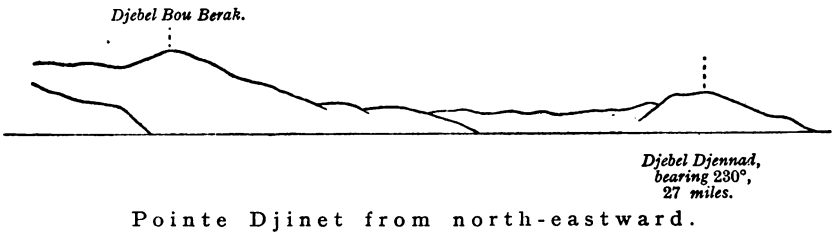


Chart 855.

Le Rocher (Bordelaise) is about 6 feet (1^m8) high and lies about 1½ miles offshore, 2 miles eastward of Îles Sandja. There are shoals eastward and westward of this rock. A detached 23-foot (7^m0) rocky patch lies about 1½ miles eastward of Le Rocher.

5

Chart 1910.

COAST.—Dangers.—Light.—From abreast Îles Sandja the coast trends about 31 miles east-north-eastward to Cap Bengut.

Ain Taya is a village situated about half a mile south-eastward of Suffren.

10

Îlots Agueli, the largest of which is 82 feet (25^m0) high, lie within one mile of the coast about 4½ miles east-south-eastward of Îles Sandja. The northern extremity of the largest islet is foul for about 1½ cables, and a rock, with a depth of less than 6 feet (1^m8), lies about 1½ cables south-south-eastward of its southern extremity.

15

Draa-ed-Dar, a hill 230 feet (70^m1) high, is situated about 2 miles south-eastward of Îlots Agueli and is a good mark. Near the coast about 2 miles eastward of this hill a prominent group of buildings stands on a wooded hill, at an elevation of 147 feet (44^m8).

Djezirat el Kadra lies close off a point about 6 miles eastward of Draa-ed-Dar; rocks and foul ground extend about 4 cables northward of it. Between these dangers and El Achaichi, about half a mile north-eastward, lies Baie Hadjar-Makreloof (*Lat.* 36° 47' N., *Long.* 3° 31' E.) where landing can be effected.

20

El Achaichi is a headland at the northern extremity of a chain of mountains, the most noticeable summits of which, Bou Arous (Bukaruk), 1,391 feet (424^m0) high, and Sidi Feredj (Fereje), 1,483 feet (452^m0) high, are situated about 4 miles south-eastward of El Achaichi. From north-westward these summits appear like a saddle, while from north-eastward they show as two sharp peaks.

30

Mers el Hadjedje (Hajeje) is an open bay between El Achaichi and a point about 2½ miles north-eastward of it.

Pointe Djinet is high and lies about 11 miles east-north-eastward of El Achaichi; about 1½ miles south-eastward of it Djebel Djennad rises to an elevation of 1,437 feet (438^m0). A rock, with a depth of less than 6 feet (1^m8), lies on a shoal about 2 cables south-westward of Pointe Djinet, and the shore of Baie Mersa Djinet, south-westward of it, is fringed by a shoal bank extending half a mile offshore in places. See view facing this page.

35

Oued Sebaou flows into the sea about 7 miles east-north-eastward of Pointe Djinet, and about 3 cables off its mouth is a 2-fathom (3^m7) patch. About 1½ miles inland this river flows between Djebel Bou Berak, a prominent conical mountain, and Djebel Thakedempt (Uamri), 1,220 feet (371^m9) high, about 2 miles east-north-eastward.

40

Cap Bengut, about 2 miles eastward of the mouth of Oued Sebaou, is easy to identify from seaward. It is situated at the eastern extremity of the mountain chain previously mentioned, and on certain bearings appears saddle-shaped. From the cape the coast trends about 1½ miles east-south-eastward to Pointe de Dellys.

45

A light is exhibited, at an elevation of 208 feet (63^m4), from a white, square tower, 95 feet (29^m0) in height, attached to a dwelling, situated on Cap Bengut. A grey look-out station, without a roof, stands, at an elevation of about 1,200 feet (365^m8), about 8 cables southward of the lighthouse.

50

Charts 1766, 160, 2158a.

Chart 1910.

Anchorage.—Small vessels with local knowledge can obtain anchorage, sheltered from westerly winds, off the village of Ain Taya.

Anchorage can be obtained, by small vessels with local knowledge, in depths of from $6\frac{1}{2}$ to 8 fathoms (11^m9 to 14^m6), rocky bottom, about one cable eastward of the middle of the largest of Îlots Agueli off a remarkable cave; a sandy bottom can be found further offshore, but the position is less sheltered.

Baie Mersa Djinet affords temporary anchorage to small vessels with local knowledge, sheltered from easterly winds.

Chart 1766, plan of Dellys.

Dellys.—**Danger.**—**Lights.**—Pointe de Dellys (*Lat.* $36^{\circ} 55' N.$, *Long.* $3^{\circ} 55' E.$) is high and narrow; about $4\frac{1}{2}$ cables within it stands a prominent building. A shallow spit extends about 3 cables north-eastward from the point, and on the south-eastern side of the point is a small jetty. Tunny nets, *see* page 27, are laid out annually off Pointe de Dellys.

A light is exhibited, at an elevation of 131 feet (39^m9), from a white turret on a white, square building, 22 feet (6^m7) in height, situated on Pointe de Dellys.

The town of Dellys affords few facilities, and is situated on the shore of a bay southward of Pointe de Dellys.

A breakwater extends about one-quarter of a mile south-south-eastward from a position about 4 cables south-westward of Pointe de Dellys.

A light is exhibited, at an elevation of 25 feet (7^m6), from a white, iron tower, 10 feet (3^m0) in height, situated on the head of the breakwater.

A quay extends about one cable eastward from the shore at Dellys, towards the head of the breakwater.

A light is exhibited, at an elevation of 25 feet (7^m6), from a white, iron tower, 10 feet (3^m0) in height, situated on the south-eastern corner of the quay.

There are depths of from 20 to 33 feet (6^m1 to 10^m1) in the south-eastern part of the harbour and of from 13 to 20 feet (4^m0 to 6^m1) alongside the quay.

Life-saving.—Life-saving appliances are maintained at Dellys; *see* page 15.

Anchorage.—**Current.**—The anchorage off Dellys is sheltered from westerly and north-westerly winds; the holding ground is good. Vessels should not anchor southward of the parallel of the quay, because of the rocky bottom. Anchorage can be obtained, in depths of 13 fathoms (23^m8), about $1\frac{1}{2}$ cables south-south-eastward of the jetty. Within about 2 cables of the shore, a counter-current sets westward and northward off Dellys; it then turns north-eastward and joins the main current.

Chart 1910.

Coast.—**Dangers.**—**Light.**—Between Dellys and Cap Corbelin, about 24 miles eastward, the coast consists of sandy beaches fronted by a bank, with depths of less than 3 fathoms (5^m5), which extends about half a mile offshore, and separated by headlands with reefs extending from them. A vessel should not get into depths less than 20 fathoms (36^m6). These dangers are covered by the *red* sector of the light on Cap Corbelin when the latter bears less than 097° .

Charts 1766, 160, 2158a.

Chart 1910.

Oued Oubay flows into the sea about 2 miles eastward of Dellys ; on the western side of its mouth stands a ruined tower, and on the eastern side a large, square, white house.

Pointe Messia lies about $2\frac{1}{2}$ miles eastward of the mouth of Oued Oubay, and from it a reef, with depths of less than 3 fathoms (5^m5), extends about $3\frac{1}{2}$ cables northward.

Arbane Millia (*Lat.* $36^{\circ} 54' N.$, *Long.* $4^{\circ} 03' E.$), about $2\frac{1}{2}$ miles eastward of Pointe Messia, is a large, white rock, over 100 feet (30^m5) high, lying close inshore.

Adrar Bou Amar (Tala-Aïcha), about $3\frac{1}{2}$ miles southward of Arbane Millia, is a prominent mountain, with a crater-like summit, 2,946 feet (897^m9) high.

Pointe Tighzirt, about 3 miles eastward of Arbane Millia, can easily be identified by the red roofs of the houses in the village of Tighzirt. An islet lies about one-quarter of a mile north-north-westward of the point, and about $3\frac{1}{2}$ cables northward of the islet is a reef, awash. There is a landing place at Pointe Tighzirt.

Cap Tedlés is a rounded projection, 820 feet (249^m9) high, on the summit of which stands the village of Taksebt.

Mechbouda (Meshbuda), about $3\frac{1}{2}$ miles southward of Cap Tedlés, is 2,767 feet (843^m0) high, and on its summit there is a remarkable clump of trees.

Sidi Khraled (Kraled) is a point, about one mile south-eastward of Cap Tedlés, on which stands a mosque. From this point Roches Sidi Khraled extend about three-quarters of a mile north-eastward.

Pointe de Timiline, about 4 miles eastward of Sidi Khraled, is dominated by two prominent rounded hills, 922 and 928 feet (281^m0 and 282^m8) high, respectively.

Pointe d'Aït Rauna lies about $5\frac{1}{2}$ miles eastward of Sidi Khraled ; it is dominated by a hill, 814 feet (248^m1) high, on which stands a village.

The coast on the western side of Pointe d'Aït Rauna is fringed by rocky shoals extending about 3 cables offshore.

Plage de Bleruna lies between Pointe d'Aït Rouna and Pointe de Mers el Farm, about $1\frac{1}{2}$ miles south-eastward ; from the latter point a reef extends about 2 cables northward. Rocher Mers el Farm, awash, and another rock, awash, lie, respectively, about 6 cables north-north-westward and one mile north-north-eastward of Pointe de Mers el Farm. Cap Sigli, *see* page 314, well open of northward of Cap Corbelin leads northward of these dangers, which are covered by the red sector of Cap Corbelin light when bearing less than 097° .

Baie Mers el Farm is entered between Pointe de Mers el Farm and Cap Corbelin, about $4\frac{1}{2}$ miles east-north-eastward ; in its south-eastern corner is the village of Port Gueydon.

At Port Gueydon (*Lat.* $36^{\circ} 54' N.$, *Long.* $4^{\circ} 25' E.$) there is a jetty, northward of which is a boat-slip. The jetty is about half a cable long, and has depths of 11 feet (3^m4) alongside its outer part.

A light is exhibited, at an elevation of 21 feet (6^m4), from a metal structure, 14 feet (4^m3) in height, situated on the head of the jetty.

Anchorage.—Small vessels, with local knowledge, can obtain anchorage, sheltered from easterly winds, under the lee of Pointe Tighzirt.

Charts 1766, 160, 2158a.

Chart 1910.

Small vessels, with local knowledge, can obtain anchorage sheltered from westerly winds, under the lee of Roches Sidi Khraled, but the holding ground is poor.

- 5 Anchorage, sheltered from easterly winds, can be obtained, by vessels with local knowledge, in depths of from $4\frac{1}{2}$ to $5\frac{1}{2}$ fathoms (7^m8 to 10^m1), westward of the jetty at Port Gueydon.

Coast.—Dangers.—Lights.—Cap Corbelin is the north-western extremity of a mountainous projection, of reddish-yellow hue, which attains elevations, at the summits of Azeffoun (Azeffun) and Azeffoun Djemane (Azeffun Jemane), of 1,352 and 1,394 feet (412^m1 and 424^m9), respectively. From the offing there would appear to be a deep bay eastward of the cape for the land on that side is low.

- 15 A light is exhibited, at an elevation of 137 feet (41^m8), from a white, circular tower, 44 feet (13^m4) in height, situated on Cap Corbelin. A signal station stands near the lighthouse.

From Cap Corbelin, the coast trends about 16 miles eastward to Cap Sigli, and in it are several well-marked stretches of sandy beach, separated by points fringed by reefs. The beaches are fronted by a bank, which, with depths of less than 3 fathoms (5^m5), extends as much as half a mile offshore in places. Vessels should not approach within depths of 20 fathoms (36^m6).

- 25 Pointe Ksila, about $10\frac{1}{2}$ miles eastward of Cap Corbelin, is dominated by two conical hills, 853 feet (260^m0) high; it is fringed by rocks extending about 4 cables offshore.

Cap Sigli only shows up well from close inshore either eastward or westward of it. It is fringed by rocks, and a detached $3\frac{1}{2}$ -fathom (6^m9) patch lies about half a mile offshore about $1\frac{1}{2}$ miles westward of it. See view facing page 311.

- 30 A light is exhibited, at an elevation of 185 feet (56^m4), from a white, circular tower, 116 feet (35^m4) in height, attached to a dwelling, situated on Cap Sigli.

Djebel Mindjou (Jebel Menju) rises to an elevation of 2,205 feet (672^m1) about $1\frac{1}{2}$ miles southward of Cap Sigli; on its summit are some rocky outcrops which resemble ruins.

From Cap Sigli the coast trends about 18 miles east-south-eastward to Cap Carbon, and is fringed with rocks, extending three-quarters of a cable offshore in places.

- 40 Djebel Arbalou (Jebel Arbalu), see view B on chart 1910, dominates this stretch of coast and rises to an elevation of 4,321 feet ($1,317^m0$), about 10 miles south-south-eastward of Cap Sigli. From north-westward its summit (*Lat. $36^\circ 45' N.$, Long. $4^\circ 51' E.$*) appears conical, but from other directions it appears rounded.

Pointe El Euch lies about $1\frac{1}{2}$ miles eastward of Cap Sigli. It is fronted by a reddish-yellow, rocky islet, 108 feet (32^m9) high, which lies close inshore and has a small rock at its northern end.

A rock, awash, lies 5 cables east-south-eastward; and a rock, with a depth of less than 6 feet (1^m8), lies $3\frac{1}{2}$ cables offshore about $3\frac{1}{2}$ miles east-south-eastward of Pointe el Euch.

- 50 Rochers des Moules, about half a mile north-north-eastward of Pointe des Moules, lie on a detached shoal; one of them is 3 feet (0^m9) high.

Pointe Bulima is reddish and lies about $1\frac{1}{2}$ miles east-south-eastward of Pointe des Moules. It is situated at the eastern end of a sandy

Chart 1910.

beach and on its western side is a small, natural boat harbour, with a narrow entrance in which lies a rock. About half a cable west-south-westward of the entrance to this boat harbour is a reef, one head of which dries.

Île Pisan is 105 feet (32^m0) high, and lies about 6 cables north-eastward of Pointe Bulima. It is fringed by above-water and sunken rocks, especially on its northern side; a detached above-water rock lies about half a mile north-north-westward of its western extremity, with foul ground between. A detached 3-fathom (5^m5) patch lies in the channel between Île Pisan and Pointe Bulima.

All the foregoing dangers are covered by the *red* sector of the lower light on Cap Carbon, bearing less than 125°.

Pointe Mezaïa, about 1½ miles south-eastward of Pointe Bulima, is surmounted by a conical hillock and is joined to the mainland by a ridge of sand, so that, from certain directions, it appears as an islet; its eastern side is fringed with rocks.

From Pointe Mezaïa the coast trends about 4½ miles east-south-eastward to Cap Carbon.

Anchorage.—Temporary anchorage can be obtained, by vessels with local knowledge, in a bay about 3 miles east-south-eastward of Cap Sigli; vessels should anchor, in a depth of 6½ fathoms (11^m9), sand, with the outermost rocks off the western entrance point of the bay bearing about 337°.

Chart 1710.

Bougie and approaches.—**Lights.**—This port is situated on the western side of Golfe de Bougie, about one mile southward of Cap Carbon (*Lat.* 36° 47' N., *Long.* 5° 07' E.).

Cap Carbon is the extremity of a small peninsula and is dominated by a small conical hill 722 feet (220^m1) high.

A light is exhibited, at an elevation of 722 feet (220^m1), from a white tower, surmounting a white dwelling, 33 feet (10^m1) in height, situated on Cap Carbon.

A light is exhibited, at an elevation of 105 feet (32^m0), from a white tower, 27 feet (8^m2) in height, situated at the foot of the cliffs on the northern side of Cap Carbon.

Djebel Gouraya (Jebel Guraya), on which stands a fort, is a prominent feature, and rises to an elevation of 2,165 feet (659^m9), about one mile west-south-westward of Cap Carbon. A signal station is situated about one cable westward of the fort.

Cap Noir and Cap Bouak lie, respectively, about 4 and 9 cables southward of Cap Carbon.

The port consists of Avant-Port, close south-westward of Cap Bouak; Vieux-Port, off the town immediately south-westward of Avant-Port and connected with it; and Arrière-Port, south-westward of Vieux-Port and connected with it.

The general depths in Avant-Port are from 18 to 36 feet (5^m5 to 11^m0), and in Vieux-Port of from 18 to 31 feet (5^m5 to 9^m5). In the north-eastern part of Arrière-Port the general depths are from 23 to 29 feet (7^m0 to 8^m8); the southern and western parts of this basin are shoal.

The entrance to Avant-Port, between the heads of Jetée Est and Jetée Sud, the north-eastern extension of Jetée du Large, faces southward and is about 2½ cables in width. Marabut de Sidi Yaya, a

Chart 1710.

prominent building with a chimney at its western end, stands near the shore, on the northern side of Avant-Port, facing the entrance.

A light is exhibited, at an elevation of 53 feet (16^m2), from a black structure, situated on the head of Jetée Est.

A light is exhibited, at an elevation of 31 feet (9^m4), from a red column situated on the head of Jetée Sud.

Vessels should not approach within 50 feet (15^m2) of the light-structure on Jetée Est.

10 Vieux-Port is entered between the heads of a jetty projecting south-eastward from Fort Abd-el-Kader, on the northern side of the harbour, and a spur projecting north-westward from the junction of Jetée du Large and Jetée Sud. Lights are exhibited from the heads of the jetty and the spur, from structures painted black and red, respectively; the passage between them is about 260 feet (79^m3) wide.

Arrière Port is protected from seaward by Jetée du Large on the eastern side, and by Jetée de Fermeture on the southern side; at the junction of these two breakwaters there is a flagstaff. The basin is entered between Quai de la Kasbah on the northern side, and the elbow of Jetée du Large on the southern side; the passage between these is about 450 feet (137^m2) wide, and a light is exhibited from each side of the entrance.

Caution.—An area dangerous to navigation, the limits of which are indicated by a pecked line on the chart, lies southward of the western part of the harbour.

Mooring buoys.—There are several mooring buoys in Vieux-Port and Arrière-Port.

Anchorage.—Pilotage.—Current.—Anchorage, sheltered from all winds except those from north to north-east, can be obtained as convenient off the breakwaters at Bougie. The bottom consists of mud and sand, and the holding ground is good where the mud is hard, but bad where it is soft.

There is usually a counter-current setting northward through the anchorage; but after heavy gales it flows round the shore of Golfe de Bougie in a direction contrary to that of the gale, though at the beginning of the gale it flows with it. See page 8.

Pilotage, see page 20, is compulsory within an imaginary line joining Cap Carbon and Pointe Aokas, see below. Pilots board vessel off the entrance to the port.

40 **Life-saving.**—Life-saving appliances are maintained at Bougie. See page 15.

Town. — Port facilities. — Communications. — Bougie (Lat. 36° 45' N., Long. 5° 05' E.) had a population of about 35,000 in 1948.

Water is laid on to the quays. A small stock of coal is maintained. 45 A British Consular officer resides here.

Tugs, lighters and floating cranes are available.

For deratisation, see page 22.

There is regular steamer communication with Marseille and with other ports in Algeria.

50 *Chart 1910.*

Coast.—Dangers.—Lights.—From Bougie, the coast forming the southern shore of Golfe de Bougie is dominated by a chain of mountains, the highest of which, named Djebel Ta Babor, rises to an elevation of 6,460 feet (1,969^m0), 7 miles inland and about 22 miles

Charts 1766, 160, 2158a.

Chart 1910.

south-eastward of the town. This mountain appears flat-topped and isolated when seen from north-westward or north-eastward, but on a southerly bearing it can only be distinguished from the others by its height and by a small spur on its western side. See view facing 5 page 311.

Dar Mohand is a detached hill, 1,001 feet (305^m1) high, situated close to the coast about 3½ miles southward of Bougie. The coast eastward of this hill is fronted by a bank, which, with depths of less than 3 fathoms (5^m5), extends about half a mile offshore in places, 10 and several points along this stretch of coast are fringed with sunken rocks.

Pointe Aokas, about 8 miles east-south-eastward of Dar Mohand, is dominated by Morne Aokas, which rises to an elevation of 1,532 feet (466^m9) and the sides of which fall steeply to the sea. See view facing 15 page 311.

In Anse des Falaises, about 8½ miles eastward of Pointe Aokas, is a transporter for loading ore.

Pointe de Ziamia is the eastern entrance point of Anse Ziamia, which cove lies close eastward of Anse des Falaises. Pointe de Ziamia may 20 be identified by a rocky ridge, 449 feet (136^m9) high, near the extremity of which stands a small house. A rock, with a depth of less than 6 feet (1^m8), lies close north-eastward of the south-western entrance point of Anse Ziamia (*Lat. 36° 40' N., Long. 5° 26' E.*).

Île Ronde (Round islet), about half a mile northward of Pointe de 25 Ziamia, is a rock, 3 feet (0^m9) high, with a 1½-fathom (2^m7) patch close southward of it.

Île Mansouria is the outermost of a group of rocks which fringe Pointe Mansouria about 2 miles eastward of Île Ronde. Rocky shoals extend a short distance north-eastward and south-westward of Île 30 Mansouria. A rock, with a depth of less than 6 feet (1^m8), lies about half a mile south-westward; and a shoal with a depth of 7 fathoms (12^m8) lies about one mile north-eastward of the island.

A light is exhibited, at an elevation of 174 feet (53^m0), from an iron column, 19 feet (5^m8) in height, situated on the summit of Île Mansouria. 35

Pointe Taza lies about 3½ miles north-eastward of Île Mansouria. Djebel Taounnart (Jebel Taunnart) rises to an elevation of 2,546 feet (776^m0), about 2 miles eastward of Pointe Taza. This mountain is in the shape of a steep roof, which from westward appears as a sharp cone, and from northward as a tableland. 40

Pointe du Djebel Er-Rihana lies about 3½ miles northward of Djebel Taounnart, and close off it is an islet 39 feet (11^m9) high.

Îlot Hadjret Tafalkout, 56 feet (17^m1) high, with a 1½-fathom (2^m7) patch about 3½ cables north-north-eastward of it, lies about half a mile offshore, and is the outermost of several dangers between Pointe 45 du Djebel Er-Rihana and Pointe Cavallo, about 1½ miles north-eastward.

Pointe Cavallo is the extremity of a chain of high conical hills separated by deep valleys; on its eastern side is a jetty.

Grand Cavallo, an islet 170 feet (51^m8) high and covered with brush- 50 wood, lies about 3 cables offshore half a mile north-eastward of Pointe Cavallo. Rocks, with depths of 3 feet (0^m9), extend a short distance north-north-eastward; and a rock, with a depth of 3½ fathoms (6^m9), lies about 3 cables northward of this islet. The channel between the

Chart 1910.

islet and the coast is available for small craft with local knowledge. See view facing page 324.

Petit Cavallo is a flat rocky islet, surrounded by reefs extending 5 as much as $2\frac{1}{2}$ cables. It lies one-quarter of a mile offshore about 2 miles north-eastward of Grand Cavallo. Roches Carcasses are two rocks lying close inshore between the two islets. A rock, with a depth of one foot (0^m3), lies about 4 cables south-westward of Petit Cavallo. The low point off which Petit Cavallo lies is dominated by a white square house.

Ras Afia lies about 2 miles north-eastward of Petit Cavallo, and from it the coast, which is fringed with reefs, trends about $2\frac{1}{4}$ miles east-north-eastward to the head of El Kalaa, a small bay about $1\frac{1}{4}$ miles westward of Djidjelli (Jijelli), see below.

15 A light is exhibited, at an elevation of 140 feet (42^m7), from a white, octagonal tower, 47 feet (14^m3) in height, attached to a dwelling, situated on Ras Afia. An auxiliary light is exhibited, at an elevation of 91 feet (27^m7), from a masonry hut, 5 feet (1^m5) in height, situated close to the main lighthouse (*Lat.* $36^\circ 49' N.$, *Long.* $5^\circ 42' E.$).

20 **Off-lying dangers.**—Banc des Kabyles, with a depth of $3\frac{1}{2}$ fathoms (6^m9), on which the sea breaks in bad weather, lies about $3\frac{1}{4}$ miles north-westward of Ras Afia.

Ecueil de la Salamandre, with a depth of $2\frac{1}{4}$ fathoms (4^m1), lies about 2 miles north-north-westward of Ras Afia.

25 Both these dangers are frequently marked by tide-rips, and are covered by the *red* sector of the auxiliary light at Ras Afia, between the bearings 124° and 154° , and by that of the main light at Djidjelli, between the bearings 100° and 105° .

The summit of Mezritane (Mes Ritan), on which is a tower at an elevation of 1,273 feet (388^m0), in line with the main lighthouse at Ras Afia, bearing 123° , leads close south-westward of Banc des Kabyles and about three-quarters of a mile south-westward of Ecueil de la Salamandre.

Djebel Seddets, see page 319, bearing 105° and well open northward 35 of Djidjelli main lighthouse, with El Koudia (Cudiat) midway between them and open of the first-named, leads about three-quarters of a mile northward of Banc des Kabyles and over one mile northward of Ecueil de la Salamandre.

Anchorage.—**Caution.**—Golfe de Bougie contains no safe 40 anchorages, except that at Port Bougie. Anse de Taza, on the south-western side of the point of the same name, would appear to afford anchorage, but it should be avoided, for it is dangerous in bad weather. Small vessels, with local knowledge, can obtain shelter from westerly and northerly winds on the eastern side of the group of rocks 45 which terminates in Îlot Mansouria. Small craft, with local knowledge, can secure alongside the jetty on the eastern side of Pointe Cavallo.

Anchorage can be obtained by vessels with local knowledge, in depths of $5\frac{1}{2}$ or $6\frac{1}{2}$ fathoms (10^m1 or 11^m9), between Pointe Cavallo 50 and Grand Cavallo, but the bottom is rocky in places and the shelter afforded is very poor; in fine weather, small craft can obtain anchorage close southward of the islet.

In fine weather, landing can be effected in Anse des Falaises, in either of the bays on either side of Pointe Ziama, in the small bay on

Charts 1766, 160, 2158a.

Chart 1910.

the eastern side of Pointe Mansouria, and in the bay at the mouth of Oued Guelil, about $2\frac{1}{2}$ miles eastward of Îlot Mansouria.

Djidjelli.—Dangers.—Lights.—The small harbour of Djidjelli (Jijelli) is protected northward by a breakwater which extends about 4 cables eastward from the eastern extremity of a small peninsula, northward of the town, to an islet, and thence south-south-eastward for about one cable. Southward the harbour is protected by a breakwater, which extends about $2\frac{1}{4}$ cables north-eastward from Mole A, which is situated north-eastward of Fort Duquesne, at the south-eastern end of the town. The entrance is about 720 feet (220^m5) wide and faces south-eastward. There is a prominent water tower close west-north-westward of Fort Duquesne.

The northern sides of the peninsula and northern breakwater are fringed with rocks and shoals, and should be given a wide berth. Depths of less than 6 fathoms (11^m0) extend 2 cables northward and eastward of the islet at the elbow of the northern breakwater.

A light (*Lat.* $36^{\circ} 50' N.$, *Long.* $5^{\circ} 47' E.$) is exhibited, at an elevation of 61 feet (18^m6), from a white square tower surmounting a dwelling, 37 feet (11^m3) in height, situated on the islet at the elbow of the northern breakwater.

A light is exhibited, at an elevation of 25 feet (7^m6), from a black beacon tower situated on the head of the northern breakwater; and another light is exhibited from a red beacon tower situated on the head of the southern breakwater.

Chart 178, plan of Jijelli.

Two quays are situated in the southern corner of the harbour, Quai Sud, on the northern side of Mole A, is 820 feet (249^m9) long and has depths alongside of from 18 to 23 feet (5^m5 to 7^m0), except near its south-western extremity where there are depths of about 11 feet (3^m4) near its junction with Quai Ouest. Quai Ouest is about 656 feet (199^m9) in length and has depths alongside its south-eastern extremity of 11 feet (3^m4), increasing to 13 feet (4^m0) at its north-western end. The deeper approach to these quays lies south-eastward of two mooring buoys. There is a small boat camber in the north-western corner of the harbour.

Lights are exhibited, at elevations of 15 feet (4^m6), one from a black structure situated on the eastern side of the entrance to the boat camber, and one from a red structure situated on its western side.

Pilotage.—This port lies in the Bougie pilotage area. A vessel requiring a pilot should make request by telephone or radio in advance to Bougie. The pilot will come out in a motor boat.

Water-level.—The level of the water varies from $1\frac{1}{4}$ to $1\frac{1}{2}$ feet (0^m4 to 0^m5). The variations are most pronounced in March and April, and sometimes amount to as much as $2\frac{1}{4}$ feet (0^m7).

Town.—Port facilities.—Djidjelli, which, in 1948, had a population of about 12,000, affords few facilities.

Water is laid on to the quays. Small tugs are available.

Chart 1910.

Coast.—Dangers.—Lights.—From Djidjelli a sandy beach extends about $14\frac{1}{2}$ miles east-north-eastward, and is backed by hills of which the most prominent are Djebel Bou-Kerlzoum (Jebel Bu Kertzum), El Koudia (Cudiat) and Djebel Seddets, respectively, 486, 367 and 3,137 feet (148^m1, 111^m9 and 956^m2) high.

Charts 1766, 160, 2158a.

Chart 1910.

A light for the use of aircraft is exhibited from a position about 6 miles east-south-eastward of Djidjelli.

- 5 Îlot Tazerouts (Tazerut), 42 feet (12^m8) high, lies close off the rocky Pointe de Tazerouts at the eastern end of the above-mentioned beach. Within about 3 miles westward of it and a short distance inland are some reddish sand hills about 290 feet (88^m4) high. From Pointe de Tazerouts the beach trends about 4 miles east-north-eastward to Mont Tahar.

- 10 Mont Tahar rises to an elevation of 1,135 feet (345^m9) close to the coast, at the north-western end of a chain of mountains of which the most important summits are Aïnen Zekka and Abrioun, respectively, 2,087 and 2,300 feet (636^m1 and 701^m0) high.

- Djemaa Aourère (Jemaa Aurera) is a small, rocky peninsula, 82 feet 15 (25^m0) high and surmounted by a shrine, about 2 miles eastward of Mont Tahar.

Oued Zhour (Wad Zhur) flows into the sea, about $3\frac{1}{2}$ miles north-eastward of Djemaa Aourère, at the southern end of a line of cliffs which continues as far as Cap Bougaroun (Bougaroni), *see* page 321.

- 20 Mersa Zitoun (Zeitun) lies about $1\frac{1}{2}$ miles north-north-eastward of the mouth of Oued Zhour. An islet with two conical summits lies close off its southern entrance point, and from abreast an isolated rock on the beach a spit, on which lies another rock, and over the extremity of which there is a depth of 6 feet (1^m8), extends about 2 cables 25 westward.

Casabianca (*Lat.* $36^{\circ} 58' N.$, *Long.* $6^{\circ} 16' E.$) is situated on the coast about one mile northward of Mersa Zitoun.

Mersa Zitoun light is exhibited, at an elevation of 36 feet (11^m0), from a white house, 5 feet (1^m5) in height, situated at Casabianca.

- 30 Îlot Lamein, 33 feet (10^m1) high, lies about $1\frac{1}{2}$ miles north-north-westward of Casabianca.

Anchorages.—During easterly winds, small vessels, with local knowledge, can obtain excellent shelter in Mersa Zitoun, between the shoal spit and the southern entrance point of the cove.

- 35 Anchorage, sheltered from northerly and easterly winds, can be obtained, by vessels with local knowledge, in depths of from 8 to 14 fathoms (14^m6 to 25^m6), about 3 cables from the beach at Casabianca, or, temporarily, in depths of $5\frac{1}{2}$ or $6\frac{1}{2}$ fathoms (10^m1 or 11^m9), sand, abreast a house with a red roof close to the shore.

- 40 *Charts 252 and 1910.*

Coast.—Dangers.—Lights.—Ras Attia (Atia) lies about $2\frac{1}{2}$ miles north-north-eastward of Îlot Lamein. A ruined house stands about half a cable northward of the lighthouse.

- A light is exhibited, at an elevation of 177 feet (53^m9), from a tower 45 surmounting a white house, 23 feet (7^m0) in height, situated on Ras Attia.

Mersa Damous is situated about $2\frac{1}{2}$ miles east-north-eastward of Ras Attia. Some houses, with red roofs, stand on the cliff on the western side of this cove. At the head of the cove there is a remarkable ravine.

- 50 *Chart 1910.*

Ras el Kmakem and Ras el Karne, which latter is fringed with rocks, lie, respectively, about $2\frac{1}{2}$ and 5 miles north-eastward of Mersa Damous, and 8 cables offshore about midway between them is a detached rock, with a depth of $2\frac{3}{4}$ fathoms (5^m0). The signal station

Chart 1910.

at Cap Bougaroun open northward of the northernmost rock off Pointe des Roches Noires, bearing more than 094° , leads 3 cables northward of this rock.

Pointe des Roches Noires (Black Rocks point) lies about half a mile eastward of Ras el Karne, and is fringed with rocks extending about 3 cables offshore. 5

Cap Bougaroun (Bougaroni), about $2\frac{1}{2}$ miles eastward of Pointe des Roches Noires, is the northern extremity of the mountainous promontory between Îlot Lamein and Collo, *see* below; there is a landing place among the rocks on the eastern side of the cape. Strong currents are sometimes experienced off the cape. In 1936, H.M.S. *Lucia* experienced a tide-rip running east-north-eastward and south-south-westward, after a westerly gale, about 18 miles north-eastward of Cap Bougaroun. *See* view facing page 324. 10 15

A light is exhibited, at an elevation of 297 feet (90^m5), from a white tower, 34 feet (10^m4) in height, attached to a dwelling, situated on Cap Bougaroun. A signal station is situated close eastward of the lighthouse.

Chart 252.

Ras el Kbiba (Kebir) lies about 4 miles south-eastward of Cap Bougaroun; on its north-western and south-eastern sides, respectively, are Anse de Tamanart and Anse des Beni-Saïd. 20

Sidi Achour (Achur) is a white shrine on the summit of a hill, 1,772 feet (540^m1) high, situated about $2\frac{1}{2}$ miles southward of Ras el Kbiba (*Lat.* $37^{\circ} 03' N.$, *Long.* $6^{\circ} 33' E.$). 25

Anchorage.—Good anchorage, with westerly winds, can be obtained, by vessels with local knowledge, in Anse de Tamanart, in a depth of about 8 fathoms (14^m6), but the swell rounding Cap Bougaroun sometimes rolls into the outer part of the anchorage. 30 35

Anchorage can be obtained, by vessels with local knowledge, in Anse des Beni-Saïd, but care must be taken to avoid a rocky reef, with a depth of less than 6 feet (1^m8), named Roches des Beni-Saïd, which lies about $3\frac{1}{2}$ cables from the head of the bay.

Chart 178, plan of Collo anchorage.

Baie En Nsa (Baie des Jeunes Filles) is entered between Pointe Sidi Yahia, the south-eastern entrance point of Anse des Beni-Saïd, and Pointe Djerda (Jerda point) about one mile south-eastward. This cove is free from dangers, and affords temporary anchorage, in depths of about 11 fathoms (20^m1), in its central part. 40

Collo.—**Lights.**—The town of Collo, which had a population of about 6,000, in 1948, is situated at the root of the peninsula of which Pointe Djerda is the extremity. Close southward of the town Koudiat el Djezaïr rises to an elevation of 325 feet (99^m1), and is surmounted by a small but prominent fort. There is a small hospital in the town. 45

Cap Collo light is exhibited, at an elevation of 85 feet (25^m9), from a white, octagonal tower, 37 feet (11^m3) in height, attached to a dwelling, situated on Pointe Djerda.

A jetty extends about three-quarters of a cable southward from a position close eastward of the town, and close westward of its root there is a quay, with depths of from 15 to 17 feet (4^m6 to 5^m2) alongside its southern face and of from 7 to 16 feet (2^m1 to 4^m9) alongside the southern part of its western face. 50

Chart 178, plan of Collo anchorage.

A light is exhibited, at an elevation of 56 feet (17^m1), from a lantern on the front of a white house, 10 feet (3^m0) in height, situated about 1½ cables south-westward of the head of the jetty at Collo.

- 5 **Anchorage.**—Baie de Collo, which is entered between Pointe Djerda and Ras Frao about 3¼ miles south-eastward, *see* chart 252, is one of the best open anchorages in Algeria, and affords excellent shelter from westerly and northerly winds.

A good berth for a large vessel is, in a depth of 15 fathoms (27^m4), with Sidi Achour in line with the church at Collo, bearing 297°, and the lighthouse on Pointe Djerda in line with the south-eastern extreme of the peninsula of which that point is the extremity, bearing 021°.

Small vessels can obtain anchorage closer to the town, in depths of from 3¼ to 5½ fathoms (5^m9 to 10^m1), about half a cable from the shore.

Landing can be effected in almost any weather.

Chart 252.

Coast.—Dangers.—Ras Frao (*Lat.* 36° 58' N., *Long.* 6° 39' E.) lies at the eastern end of a sandy beach, which is dominated by Morne Telezza, an isolated, conical, wooded hill, 623 feet (189^m9) high. Ras Erded is situated about 2½ miles east-south-eastward of Ras Frao.

Îlot M'Ta (Mta island), about 200 feet (61^m0) high, lies half a mile offshore about one mile eastward of Ras Erded, and is not easy to distinguish from the coast behind it.

- 25 **Ras Kalaa or Bibi** lies about 3 miles eastward of Ras Erded, and about half a mile west-north-westward of the former is Îlot Bibi, about 150 feet (45^m7) high.

Pointe des Sept Îles, from which a chain of islets extends about 3 cables north-north-westward, lies about 1½ miles east-south-eastward of Ras Kalaa.

Pointe Esra, about 3 miles eastward of Pointe des Sept Îles, is fringed by conical islets, the outermost of which is 144 feet (43^m9) high. A spit, with a depth of 2½ fathoms (5^m0) over its extremity, extends about half a mile northward from the point.

- 35 Between Pointe Esra and Cap Akmès, about 2 miles south-eastward, the coast forms a sandy bight, at the head of which stands a large, white house with a red roof.

Anchorage.—Small vessels, with local knowledge, can obtain sheltered anchorage eastward or westward of Ras Erded, according to the direction of the wind, or on the southern side of Îlot M'Ta.

Good anchorage can be obtained, by vessels with local knowledge, in the bays on either side of Ras Kalaa.

- Baie d'Esra affords fairly good shelter from westerly winds, in depths of 11 fathoms (20^m1), but the anchorage off Stora, *see* page 323, is to be preferred.

PHILIPPEVILLE AND APPROACHES.—Aspect.—Philippeville is situated about 3 miles south-south-eastward of Cap Akmès, and is easily identified; westward is the mountainous promontory of which Cap Bougaroun is the extremity, and eastward lies Cap de Fer, *see* page 325.

Between the town and the promontory are the summits of Guern-Aïcha (Keurn Aïcha), 7½ miles southward of Collo and 1,841 feet (561^m1) high; Sidi Ali, 1,788 feet (545^m0) high, about 3¼ miles south-

Charts 160, 2158a.

Chart 252.

ward of Ras Frao ; Demnia, 2,182 feet (655^m1) high and surmounted by a beacon, about 3½ miles southward of Ras Erded ; Kef el Amra, 1,962 feet (598^m0) high, about 5 miles southward of Îlot M'Ta ; Djebel Asra (Jebel Ezra), 1,745 feet (531^m9) high, about 2 miles southward of 5
Pointe des Sept Îles ; and Djebel Bellout (Jebel Ballout), 1,834 feet (559^m0) high, about 1½ miles southward of Pointe des Sept Îles.

About 9 miles eastward of the town lies the mountainous district of Filfila (Felfelah), the summit of which is a rocky peak, 1,923 feet (586^m1) high, with Koudiat Keberta or El Azem, 1,841 feet (561^m1) 10
high, about 2½ miles south-eastward of it.

Between these last mountains and those surrounding the promontory of which Cap de Fer is the north-western extremity, is the large depression of Oued El Kebir. About one mile from the coast and 8 miles east-south-eastward of Cap de Fer is Sidi Samza, 1,198 feet 15
(365^m1) high, a prominent hill with a much serrated crest.

Chart 178, plan of Stora and Philippeville anchorages.

Coast.—Dangers.—Lights.—Île Srigina, about 3½ cables north-eastward of Cap Akmès, is surrounded by above-water rocks and shoals extending a short distance, as is Cap Akmès. 20

A light is exhibited, at an elevation of 176 feet (53^m6), from a white square tower, 38 feet (11^m6) in height, attached to a dwelling situated on Île Srigina (*Lat.* 36° 56' N., *Long.* 6° 54' E.).

Île du Lion, a conical islet, 98 feet (29^m9) high, lies about one cable east-north-eastward of Cap Est, and about 8 cables south-south- 25
eastward of Cap Akmès. This islet is surrounded by shoals, and Le Lionceau, a smaller islet, lies close north-eastward of it.

Rocher du Lazaret dries 2 feet (0^m6), and lies 1½ cables offshore about half a mile southward of Cap Est. This rock and the dangers surrounding Île du Lion are covered by the *green* sector of the light 30
on Îlot des Singes, between the bearings 142° and 211°, and also by the *red* sector of the light at the head of the northern breakwater at Philippeville, *see* page 324, between the bearings 297° and 169°.

Îlot des Singes, on the northern side of Baie de Stora, lies close in- 35
shore about three-quarters of a mile southward of Cap Est, and is connected with the mainland by a bridge.

A light is exhibited, at an elevation of 54 feet (16^m5), from a pyramidal tower, 29 feet (8^m8) in height, attached to a dwelling in a battery situated on Îlot des Singes.

The village of Stora is fronted by a beach of sand and shingle ; it 40
stands at the head of Baie de Stora. At the southern end of the beach is a rocky point from which Rochers de la Marne extend about one-quarter of a cable. In bad weather heavy seas roll into Baie de Stora.

A light is exhibited, at an elevation of 18 feet (5^m5), from a post, 45
10 feet (3^m0) in height, situated on the head of a small jetty about 1½ cables south-westward of Îlot des Singes.

Anchorage.—Caution.—In Baie de Stora and its approach, anchorage is prohibited in an area the limits of which are indicated on the chart by pecked lines, owing to the existence of telegraph cables 50
therein, *see* page 19.

Baie de Stora affords good protection from westerly, but not from north-westerly, winds. In fine weather, large vessels can obtain anchorage, south-eastward of Îlot des Singes and clear of the prohibited

Charts 160, 2158a,

Chart 178, plan of Stora and Philippeville anchorages.
 area, in depths of 9 or 10 fathoms (16^m5 or 18^m3), sand. In winter, vessels should anchor further out, in depths of 11 or 12 fathoms (20^m1 or 21^m9). Small vessels can anchor about 1½ cables from the village, in depths of from 3¼ to 4½ fathoms (5^m9 to 7^m8).

Harbour.—Lights.—Submarine cable.—The harbour at Philippeville lies between Pointe du Chateau Vert, about 1½ miles south-eastward of Ilot des Singes, and Cap Skikda, about one mile farther east-south-eastward. It is protected northward by a breakwater, 30 feet (9^m1) high, which extends about 8 cables north-westward from Cap Skikda; and westward by Jetée du Chateau Vert, which extends about 2½ cables north-north-eastward from close south-eastward of Pointe du Chateau Vert. The harbour is divided, by a transverse mole and a spur of the breakwater, into Avant Port and La Darse (*Lat.* 36° 53' N., *Long.* 6° 55' E.), the entrances to both being about half a cable wide.

A submarine cable is laid across the entrance to La Darse; anchorage is prohibited in its vicinity. *See* page 19.

A light is exhibited, at an elevation of 69 feet (21^m0), from a masonry tower, 45 feet (13^m7) in height, situated on the head of the breakwater.

A light is exhibited, at an elevation of 34 feet (10^m4), from a grey, metal tower, 27 feet (8^m2) in height, situated on the head of the spur of the breakwater.

A light is exhibited, at an elevation of 33 feet (10^m1), from a metal tower, 27 feet (8^m2) in height, situated on the head of Jetée du Chateau Vert.

A light is exhibited on either side of the entrance to La Darse.

The depths in Avant-Port vary from 6 feet (1^m8) along its southern side, to 52 feet (15^m8) near the breakwater. Vessels drawing up to 18 feet (5^m5) can secure alongside the quays, and those drawing up to 25 feet (7^m6) can lie 16 feet (4^m9) from the quay sides. There are 950 feet (289^m6) of quays, of which 650 feet (198^m1) are fit for berthing alongside.

There are quays on all, except the northern, sides of La Darse; they are connected with the railway system. There are depths of from 23 to 39 feet (7^m0 to 11^m9) in the basin. Vessels drawing 18 feet (5^m5) can lie alongside. There is one berth for a vessel 450 feet (137^m6) long, drawing 26 feet (7^m9), with lighters between her and the quay.

Westerly winds raise the level of the water in the harbour by about one foot (0^m3), and easterly winds lower it by about the same amount.

Directions.—Pilotage.—Pilotage, *see* page 20, is compulsory south-westward of an imaginary line joining Le Lionceau and Cap Skikda.

A vessel approaching the harbour should steer for Île Srigina until the hill above Cap Skikda can be identified, soon after which the breakwater and entrance to the harbour will be distinguished.

At night, a vessel approaching from westward should not alter course to round Île Srigina until in the *white* sector of the light on the head of the breakwater between the bearings of 169° and 297°. As the light on Ilot des Singes turns from *green* to *white*, bearing 211°, she may steer to enter the *red* sector of the first-mentioned light, and when the lights on either side of the entrance to Avant-Port are sighted they should be steered for.



Grand Cavallo, bearing 225°, 3 miles. Cap Cavallo. Hadjet Tafalkout.
Grand Cavallo from north-eastward.
(Original dated 1906.)



Cap Bougaroun,
bearing 090°,
18 miles.

Cap Bougaroun from westward.
(Original dated 1899.)



Lighthouse.
Cap de Fer from eastward.
(Original dated 1948.)



Lighthouse,
bearing 240°,
12 miles.
Cap de Fer from east-north-eastward.
(Original dated 1932.)



Voile Noire,
bearing 145°, 8 miles.
Voile Noire from north-westward.
(Original dated 1899.)



Cap de Garde
Lighthouse.

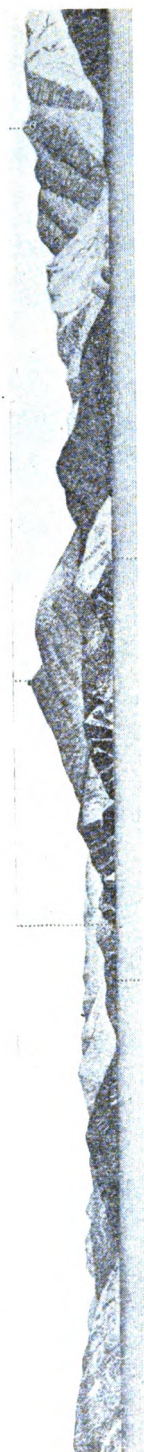
Voile Noire.

Cap Akcine.

Sidi Ben Hout.

Sidi Yahia, bearing
about 189° , $1\frac{1}{2}$ miles.

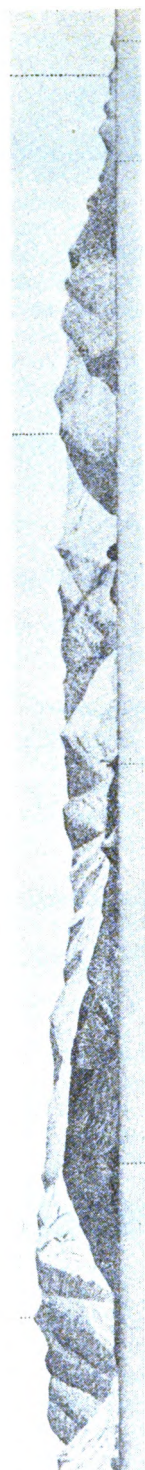
a



Baie de
Takouch.

a

b



Ile Takouch.

Sidi
Akkacha.

Islet.
Cap de Fer
Lighthouse.

View, in three parts, of coast from Cap de Fer to Cap de Garde.
(Original dated 1869.)

Chart 178, plan of Stora and Philippeville anchorages.

A large vessel should not pass close to the heads of the jetties on either side of the entrance to Avant-Port, or of La Darse, as they are not steep-to.

Life-saving.—A lifeboat is stationed at Philippeville; *see* page 15. 5

Town.—**Port facilities.**—**Communications.**—Philippeville had a population of about 50,000, in 1948. There is a hospital. For deratisation, *see* page 23.

Water is laid on to the quays. A small stock of coal is usually maintained, but cannot be relied upon. There are a number of lighters. 10
Minor repairs can be effected. There is a 3-ton crane on the quay and a 25-ton floating crane is available.

There is regular steamer communication with Marseille and with other ports on the coast of Africa.

Chart 252.

15

COAST.—**Dangers.**—**Lights.**—From Cap Skikda, on which stands a white house, a sandy beach extends about $6\frac{1}{2}$ miles east-north-eastward to the rocky cliffs of Ras Filfila (Felfelah), on the north-eastern side of which is a conical rock, 115 feet (35^m0) high. The small village of Saint Louis (*Lat.* 36° 55' N., *Long.* 7° 07' E.), 20
where there is a jetty with a pontoon at its head, lies near the head of a creek on the eastern side of Ras Filfila.

Oued el Kébir flows into the sea about 9 miles north-eastward of Ras Filfila, and close northward of its mouth is a white shrine. Southward of its mouth is a low beach, at the southern end of which are some 25
shoals about half a mile offshore. Northward of the mouth of the river are some sandy bays separated by rocky projections.

Pointe de Sidi Bou Merouane (Sidi bu Meruan) lies about $1\frac{1}{2}$ miles northward of the mouth of Oued el Kébir, and on it stands a shrine; this point is fringed with foul ground which will be cleared by keeping 30
the islet off Cap de Fer just open of the land south-eastward of it. On the south-eastern side of the point is a shingle beach at the head of the anchorage of El Mersa, and behind the beach is a small village.

A light is exhibited, at an elevation of 20 feet (6^m1), from a white hut, 5 feet (1^m5) in height, situated on Pointe de Sidi Bou Merouane. 35

Anse des Corailleurs and Anse des Espagnols lie close south-eastward of Cap de Fer.

Cap de Fer, about 5 miles north-westward of Pointe de Sidi Bou Merouane, is one of the most salient capes on the coast of Algeria, and the high land south-eastward of it is very prominent, *see* page 323 and 40
view facing page 324. About $3\frac{1}{2}$ cables westward of the cape is a rocky islet, 115 feet (35^m0) high, with some rocks close westward of it. In winter strong currents are experienced in the vicinity of the cape, and with west-north-westerly winds there is a heavy swell.

A light is exhibited, at an elevation of 215 feet (65^m5), from a circular 45
white tower, 57 feet (17^m4) in height, attached to a dwelling situated on Cap de Fer.

From Cap de Fer the coast trends about $10\frac{1}{2}$ miles eastward to Cap Takouch (Tukush), and is fringed in places by rocks and shoals extending about half a mile offshore. *See* view facing this page. 50

Sidi Akkacha (Akeche) is a prominent white shrine on a point about $5\frac{1}{2}$ miles eastward of Cap de Fer.

Ile Toukoush, about one mile offshore $2\frac{1}{2}$ miles eastward of Sidi

Charts 160, 2158a.

Chart 252.

Akkacha, is 108 feet (32^m9) high. A rock, with a depth of less than 6 feet (1^m8), lies midway between the islet and the coast.

Anchoragees.—Small vessels, with local knowledge, can obtain anchorage in the creek on the eastern side of Ras Filfila (*Lat.* 36° 55' N., *Long.* 7° 08' E.), in depths of from 2 to 4½ fathoms (3^m7 to 7^m8), but there is a rock awash about half a cable from the beach.

Anchorage, somewhat sheltered by Pointe de Sidi Bon Merouane, can be obtained by vessels with local knowledge in the anchorage of 10 El Mersa, but its north-western part is encumbered with rocks.

Anse des Corailleurs affords shelter to small vessels, with local knowledge, but an above-water rock obstructs the entrance.

Anse des Espagnols affords anchorage to small vessels with local knowledge, in a depth of 8 fathoms (14^m6); vessels should anchor in 15 the middle of the bay, with two points, close westward of it, in line. There is a rock awash about one-quarter of a cable off the beach in the north-eastern corner of the bay.

Anchorage, sheltered from easterly winds, can be obtained by vessels with local knowledge, in Baie de Sidi Akkacha. On the western side 20 of the bay is a rock, with a depth of less than 6 feet (1^m8), and about 4 cables west-north-westward of the shrine there is a detached 4½-fathom (8^m7) patch; several above-water rocks lie within half a mile northward of the eastern entrance point of the bay.

Off-lying bank.—**Current.**—Seiche de Takouch, with depths of 25 from 11 to 20 fathoms (20^m1 to 36^m6), rock, lies one mile north-north-westward of Cap Takouch. A depth of 7 fathoms (12^m8), the existence of which is doubtful, was reported, in 1946, to lie on this bank about 2½ miles north-north-westward of Cap Takouch.

A current, with a rate at times of as much as 2 knots, is sometimes 30 experienced on this bank, and in bad weather the sea over it is especially heavy; vessels should avoid passing over it.

Chart 178, plan of Mersa Tukush Herbillon.

Baie de Takouch and approaches.—**Dangers.**—**Lights.**—Cap Takouch (Tukush) is the north-eastern extremity of a small peninsula, 35 on the summit of which, at an elevation of 676 feet (206^m0), stands Sidi Merkeb, a prominent, white shrine. Close north-eastward of Cap Takouch lie two islets, almost joined to the coast, the outer and larger of which, Île Djezira, is 210 feet (64^m0) high.

A light is exhibited, at an elevation of 420 feet (128^m0), from a white, 40 masonry tower, 39 feet (11^m9) in height, situated about 4 cables southward of Cap Tarouch.

Roche Begra and Roche Turque, with depths, respectively, of 6 feet (1^m8) and less than 6 feet (1^m8), lie in the approach to the bay on the north-western side of the peninsula of which Cap Takouch is the north- 45 eastern extremity.

Baie de Takouch is entered between Île Djezira and La Pointe Percée (*Lat.* 37° 03' N., *Long.* 7° 24' E.) about 2 miles southward.

La Pointe Percée and the south-western shore of the bay are fringed with above-water and sunken rocks, extending about 1½ cables offshore 50 in places.

Roche Felkoun (Felkum), with a depth of 10 feet (3^m0), lies about 2 cables eastward of a 75-foot (22^m9) islet, lying close inshore near the middle of the south-western side of Baie de Takouch.

Herbillon is a village situated on the shore of a cove at the head of

Chart 178, plan of Mersa Tukush Herbillon.

Baie de Takouch. On the northern side of the cove is a small harbour formed by two jetties at right angles to the shore. Between the jetties is some reclaimed land at the eastern end of which is a quay, about 410 feet (125^m0) long, with depths of from 16 to 20 feet (4^m9 to 6^m1) alongside. There is a mooring buoy in the harbour and two small slipways. 5

A light is exhibited from the head of each of the two jetties, the eastern one at an elevation of 26 feet (7^m9).

Mont Sidi Yahia, a conical mountain, 1,788 feet (545^m0) high, which 10 is surmounted by a shrine, is situated about 1½ miles south-south-westward of Herbillon. See view facing page 325.

Anchorage.—Good shelter from westerly winds can be obtained in Baie de Takouch, but north-easterly and easterly winds send in a heavy sea. Vessels anchor, in depths of from 5½ to 11 fathoms (10^m1 to 20^m1), with the church in Herbillon bearing 270°, and the extreme of the land in the north-eastern part of the bay bearing about 022°. *Chart 252.*

Coast.—Danger.—From La Pointe Percée the coast trends about 19 miles east-south-eastward to Cap de Garde. 20

Sidi Benout (Ben Hout) is a white shrine surmounting a flat-topped conical hill, 1,752 feet (534^m0) high, half a mile inland, about 4½ miles south-eastward of Cap Takouch.

Cap du Matefouch (Akcine), about 2½ miles eastward of Sidi Benout, is reddish in colour and is dominated by Sommet du Matefouch 25 (Gouari), 1,873 feet (570^m9) high. A rock, with a depth of 3½ fathoms (5^m9), lies about 3 cables offshore 1½ miles westward of Cap du Matefouch.

Roche Akcine has several heads, one of which is awash. It lies half a mile from the northern side of Cap du Matefouch and is covered by 30 the red sector of the light on Cap Takouch, between the bearings of 278° and 290°.

Sidi Bou Zeid (Buzid) is a shrine surmounting a coastal hill about 4 miles south-south-eastward of Cap du Matefouch and, when not hidden by a neighbouring wood, is a prominent feature. At the foot 35 of the hill stands the village of Aïn Barbar, in which there is a tall chimney.

Pointe du Pain de Sucre (Sugarloaf), about 4½ miles eastward of Sidi Bou Zeid, is prominent. It has a rocky crest, about 1,600 feet (487^m7) high, and terminates in a pyramidal hill (*Lat.* 36° 59' N., *Long.* 7° 40' E.) about 500 feet (152^m4) high.

Voile Noire, close inshore about one mile south-eastward of Pointe du Pain de Sucre, is a conical rock 213 feet (64^m9) high. See views facing pages 324 and 325.

Djebel Edough (Edugh) is a range of mountains which culminates, 45 about 8½ miles south-westward of Cap de Garde, in Kef Seba, 3,307 feet (1,008^m0) high, whence a ridge slopes down to the cape.

BÔNE AND APPROACHES.—Aspect.—The town of Bône is situated on the western shore of Golfe de Bône, about 4 miles southward of Cap de Garde. 50

Golfe de Bône is easily identified, and at a distance appears larger than it is in reality. It is entered between Cap de Garde and Cap Rosa, about 21 miles eastward. The heights descending to either entrance

Chart 252.

point are separated, at the head of the gulf, by a low plain, which, at some distance inland, is backed by detached mountains.

Prohibited area.—An area in which fishing and anchoring is prohibited, on account of submarine telegraph cables, *see* page 19, the limits of which are indicated by pecked lines on the chart, is situated in the western part of Golfe de Bône.

Chart 1567.

Coast.—Dangers.—Lights.—Cap de Garde, *see* also view facing page 325, is fringed with rocks on its northern and eastern sides extending $1\frac{1}{2}$ cables offshore in places, and when seen from eastward or westward appears from a distance as an island; near its extremity are two hills. The rocks off the cape are covered by the *green* sector of the light on Jetée du Lion, at Bône, between the bearings 170° and 190° .

A light is exhibited, at an elevation of 469 feet (142^m9), from a white square tower, 46 feet (14^m0) in height, in front of a square building situated about 4 cables westward of Cap de Garde. A signal station stands, at an elevation of 518 feet (157^m9), on the summit of a hill about one-quarter of a mile south-westward of the lighthouse.

Fort Genois (*Lat.* $36^\circ 57' N.$, *Long.* $7^\circ 47' E.$) stands on a rounded point, 151 feet (46^m0) high, about one mile south-south-westward of Cap de Garde.

A spit, with depths of less than 3 fathoms (5^m5), extends about $1\frac{1}{2}$ cables offshore from the coast eastward of Fort Genois.

A light is exhibited, at an elevation of 197 feet (60^m0), from a white building, 23 feet (7^m0) in height, situated about 2 cables west-south-westward of Fort Genois.

Pointe du Lion, on the northern side of the harbour of Bône, is rocky, steep on its seaward side, with a large rock, 56 feet (17^m1) in height, close to it. It is situated about $2\frac{1}{2}$ miles southward of Fort Genois, and between them lie Baie du Lazaret and Mouillage du Caroubier.

Rocks, with depths of less than 6 feet (1^m8), lie within $1\frac{1}{2}$ cables of the shore about half a mile northward of Pointe du Lion.

An area of foul ground, the limits of which are indicated by a pecked line on the chart, lies about half a mile south-south-westward of the head of Jetée Sud.

Oued Seybouse (Seibus) flows into the sea, on the southern side of the harbour, about $1\frac{1}{4}$ miles southward of Pointe du Lion, and about three-quarters of a mile west-south-westward of its mouth is the prominent Basilica of Saint Augustin. The depths off the mouth of the river are shoal and liable to change with each rainy season.

La Petite Seiche and Roche Saint Joseph, with depths of 7 fathoms (12^m8), rock, lie about $1\frac{1}{2}$ miles eastward and $3\frac{1}{2}$ miles east-south-eastward, respectively, of the entrance to the harbour at Bône.

Roche du Vautour, with a depth of $4\frac{1}{2}$ fathoms (8^m2), lies about 3 miles south-eastward of the entrance to the harbour.

Harbour.—Lights.—The harbour of Bône is protected by Jetée du Lion and Jetée Sud. It is divided by transverse spurs into Avant-Port, Grande Darse, and Petite Darse. Passe de la Jetée Babayaud leads from Avant-Port to Grande Darse, and Passe Cigogne leads from Grande Darse to Petite Darse.

A light is exhibited, at an elevation of 62 feet (18^m9), from a white iron tower, 56 feet (17^m1) in height, situated on the head of Jetée du Lion.

Charts 160, 2158a.

Chart 1567.

A light is exhibited, at an elevation of 49 feet (14^m9), from a white iron tower, 43 feet (13^m1) in height, situated on the head of Jetée Sud.

Lights are exhibited, at elevations of 26 feet (7^m9), one from each of the heads of the spurs on either side of Passe de la Jetée Babayaud and Passe Cigogne, and one from the south-eastern corner of a quay in the western part of Grande Darse. 5

Vessels up to 525 feet (160^m0), 62 feet (18^m9) beam and drawing 28 feet (8^m5) can be accommodated. There are several mooring buoys. 10

The northern and western sides of the two inner basins are lined with wharves, and on reclaimed land on their southern sides are some mineral wharves. There is a small wharf, for landing explosives, etc., in Avant-Port, with a depth alongside of 15 feet (4^m6). 15

Anchorage.—Caution.—For prohibited area, *see* page 328. 15

During north-westerly gales, heavy seas are experienced off the entrance of the harbour.

Anchorage can be obtained as convenient, in depths of 11 or 12 fathoms (20^m1 or 21^m9), in Baie du Lazaret, southward or south-south-westward of Fort Genois. A vessel should anchor with the lighthouse at Cap de Garde in line with the western extreme of the fort, bearing about 013°, and should approach no nearer to the shore. Though a swell sometimes rolls in to this anchorage, it does not break. The anchorage is completely sheltered from westerly and north-westerly winds, and those from north-eastward and eastward seldom blow home. 25

Anchorage can also be obtained in Mouillage du Caroubier, but it is not so safe as that in Baie du Lazaret, and care should be taken to avoid a 5½-fathom (9^m6) shoal 2 cables offshore about 6 cables northward of Pointe du Lion. 30

Pilotage.—Regulations.—Pilotage, *see* page 20, is compulsory south-westward of an imaginary line joining Cap de Garde and the mouth of Oued Mafragh, *see* page 330.

Special regulations are in force in the harbour of Bône and its approach, a copy of which should be obtained on arrival; the principal ones are as follows:— 35

Vessels leaving the harbour have precedence over those entering, with the exception of the mail steamers and vessels in distress, which have precedence at all times.

A vessel approaching the harbour, and about to enter, shall sound one long blast on the siren or whistle. Should any vessel within the harbour be about to leave, she shall sound two long blasts, and the vessel about to enter must give way accordingly. The mail steamer, when about to enter, will give two long blasts instead of one. 40

Small craft must keep out of the way of large vessels, and are not affected by the foregoing regulations. 45

Town.—Port facilities.—Communications.—Bône, in 1948, had a population of about 62,000, and in it are a civil and a military hospital. For deratisation, *see* page 23. A British Consular officer resides in the town (*Lat.* 36° 54' N., *Long.* 7° 46' E.). 50

Water is laid on to the wharves.

A stock of coal is maintained, and can be put on board, either alongside the wharf by electric transporters or it can be sent off in lighters. Fuel oil is obtainable, there is a pipe-line to the oiling jetty

Chart 1567.

on the southern side of Grande Darse, and there is also a 50-ton tank-vessel.

Minor repairs can be executed. There is a fixed 110-ton crane and a floating 60-ton crane. There are numerous other fixed cranes of from 3 to 10 tons capacity. A diver is available.

There is regular steamer communication with Marseille, Ajaccio, Bizerta and Tunis.

There is air communication with Morocco and Tunisia.

10 *Chart 252.*

COAST.—Dangers.—Light.—From the mouth of Oued Seybouse, a sandy beach, backed by low, wooded dunes, extends about 9 miles east-south-eastward to the mouth of Oued Mafragh.

Djebel Bou Abaed (Bu Abaid) is a good mark and rises to an elevation of 2,425 feet (739^m1), about 11 miles south-south-eastward of the mouth of Oued Mafragh (*Lat.* 36° 51' N., *Long.* 7° 57' E.).

From the mouth of Oued Mafragh, the coast trends about 15 miles east-north-eastward to Cap Rosa; it consists of a succession of cliffs from 160 to 330 feet (48^m8 to 100^m6) high.

Cap Rosa is rocky, covered with brushwood and dominated by Djebel Karoussa, 810 feet (246^m9) high. Its western side is faced with reddish cliffs.

A light is exhibited, at an elevation of 419 feet (127^m7), from a white tower surmounting a dwelling, 43 feet (13^m1) in height, situated on Cap Rosa.

From Cap Rosa, the coast trends about 10 miles east-south-eastward to Port de la Calle.

Rocher de Schiavone, conical and 115 feet (35^m0) high, lies close off a point about 1½ miles south-eastward of Cap Rosa. North-westward and south-eastward, respectively, of Rocher de Schiavone, are Baie du Grand Canier and Baie du Petit Canier.

A rocky patch, with a depth of 2½ fathoms (4^m6), lies 3½ cables offshore about 4 miles east-south-eastward of Cap Rosa.

There is a ruined tower, with the remains of some buildings near it, on the coast about 5 miles east-south-eastward of Cap Rosa.

Bec de l'Aigle, about one-quarter of a mile westward of Cap Gros, is a salient point which shows up from westward.

Cap Gros, *see* view facing page 346, lies about 8 miles east-south-eastward of Cap Rosa. It is easily identified as it rises to Kef el Alem, 771 feet (235^m9) high.

Baie de Boulipha (Bulipha) is situated westward of Pointe Noire, which point lies about 1½ miles south-eastward of Cap Gros. It has a sandy beach.

Anchorage.—Baie du Grand Canier and Baie du Petit Canier afford fairly good shelter to vessels with local knowledge, from winds between west and west-north-west, but both are open north-eastward.

Baie de Boulipha affords fairly good shelter to vessels with local knowledge, from westerly winds, but with north-westerly ones a heavy swell rolls in round Cap Gros.

Chart 252, plan of Port de la Calle.

Port de la Calle.—Light.—This small harbour is entered between Pointe Noire and Îlot de France, about 2½ cables eastward.

Charts 165, 160, 2158a.

Chart 252, plan of Port de la Calle.

Pointe Noire is rocky, 49 feet (14^m9) high, and close off its western side is Île Maudite, a rock, 36 feet (11^m0) high.

Îlot de France has numerous buildings on it, and its south-eastern end is connected with the mainland by quays at the head of the harbour.

A light is exhibited, at an elevation of 54 feet (16^m5), from a white circular tower, 24 feet (7^m3) in height, attached to a dwelling situated on the western end of Îlot de France (*Lat.* 36° 54' N., *Long.* 8° 27' E.).

There is a signal station in Tour du Moulin, on the opposite side of the harbour, at which a red flag is displayed by day, or two red lights disposed vertically are exhibited at night, when entry is impracticable.

The harbour affords but little shelter. In 1948, it could only be entered by small vessels, drawing up to 10 feet (3^m0), and then only in fine weather; local knowledge is necessary. A spur extends from the southern side of the harbour and divides it into two small basins. In 1946, there were depths of 11½ feet (3^m5) in the middle of the channel through the outer basin, and of 10 feet (3^m0) at the sides. Northward of the channel there were depths of 6½ feet (2^m0), and less. The channel to the quay on the northern side of the inner basin had, in 1946, depths of 10 feet (3^m0).

Anchorage.—Open anchorage can be obtained 4 or 4½ cables northward of the lighthouse on Îlot de France, in depths of from 11 to 14 fathoms (20^m1 to 25^m6), sand and gravel, but the holding ground is poor.

Town.—Port facilities.—Communications.—The town, which, in 1948, had a population of about 5,000, stands on the southern side of the harbour, and offers few facilities. Water is laid on to the quay, but is scarce in summer.

There is a hospital. Coasting steamers call when weather permits.

Chart 252.

Coast.—From Port de la Calle, the coast trends about 9 miles east-north-eastward to Cap Roux. Close south-eastward of the mouth of a river about 3¼ miles eastward of the port is Monte Rotondo (Round), which rises to an elevation of 584 feet (178^m0). On the coast at the foot of this hill is a factory with tall chimneys, in ruins.

Off-lying bank.—Banc le Sec, with depths of from 24 to 30 fathoms (43^m9 to 54^m9), lies about 17½ miles north-north-eastward of Port de la Calle.

Charts 2518a and b.

TUNISIA.—General Remarks.—The coast of Tunisia, called by the French Tunisie, extends eastward from Cap Roux for about 120 miles to Cap Bon, and thence about 240 miles southward to Ras Ajdir (Ashdir), *see* page 374; in it are three large bights, and off it are several islets, rocks, and dangerous shoals.

The northern coast is similar to that of Algeria, and is bold, rocky, and dominated by the northern ranges of the eastern part of the Atlas mountains.

The eastern coast becomes less bold and the mountain ranges recede from it as the latitude decreases.

Chart 252.

Coast.—Cap Roux, *see* view facing page 346, can be identified by the reddish cliffs on its western side; it is at the north-eastern end

Charts 165, 160, 2158a.

Chart 252

of a ridge of mountains which descend from Kef Oukdeyad (Segleb), 1,073 feet (327^m0) high, situated about 1½ miles south-westward of it. On the eastern side of the cape is a plateau on which stand the ruins of a tower and some houses.

Djebel Adissa and Djebel Abdallah, *see* view on chart 252, form part of a chain of mountains which extends north-eastward to Djebel El Msid, *see* page 333, and rises to elevations of 2,917 and 2,871 feet (889^m1 and 875^m1), about 13 miles southward and 11 miles south-10 south-eastward, respectively, of Cap Roux.

From Cap Roux, the coast trends about 6½ miles east-north-eastward to Cap Tabarka. It is high and indented, and consists of cliffs separated by sandy beaches fringed with rocks.

Pointe Galina (Galena) lies about 1½ miles westward of Cap Tabarka, 15 and on a coastal hill between them stands a prominent white house. *Chart 252, plan of Tabarka.*

Tabarka.—Dangers.—Lights.—Cap Tabarka consists of rugged grey cliffs and is fringed with rocks. A rock, 13 feet (4^m0) high, lies about 1½ cables from its northern side.

20 Île de Tabarka, crowned by a ruined castle, *see* view on chart 252, is 210 feet (64^m0) high, and lies one-quarter of a mile offshore about three-quarters of a mile south-eastward of the cape; its northern side is faced with steep cliffs, and it slopes gently to its southern end, where there are some ruins. The island is fringed with rocks and shoals 25 extending about one cable offshore in places, and is connected with the mainland, at its southern end, by a shallow bar on which is a rubble breakwater, with a boat-passage, 65 feet (19^m8) wide, through it. A jetty, with a depth of about 18 feet (5^m5) at its head, extends from the south-eastern side of the island.

30 A light is exhibited, at an elevation of 236 feet (71^m9), from a masonry structure, 26 feet (7^m9) in height, situated in the ruins of the castle on Île de Tabarka (*Lat. 36° 58' N., Long. 8° 46' E.*).

The small harbour is between the island and the mainland, and is protected eastward by the above-mentioned breakwater, and west- 35 ward by two jetties, the southern of which extends north-north-eastward from Pointe des Aiguilles, about three-quarters of a mile south-eastward of Cap Tabarka, and the northern of which extends from the south-western extremity of Île de Tabarka; the entrance is between the two jetties. There are some rocks in its northern 40 corner, marked by a pile; and in the middle of the harbour there is a buoy.

The village of Tabarka lies on the southern side of the harbour, where there are two landing places.

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron 45 column, 20 feet (6^m1) in height, attached to a hut situated near the root of the south-eastern landing place.

Anchorage.—Anchorage can be obtained either eastward or westward of Île Tabarka, but neither affords good protection, and the holding ground is bad.

50 The western anchorage is somewhat sheltered by the island, and is nearer the landing places, but it is dangerous in bad weather.

In the eastern anchorage, also known as the summer anchorage, vessels anchor as convenient with the north-eastern angle of the fort, on a plateau above and close north-westward of the village, in line

Chart 252, plan of Tabarka.

with the southern wall of the cemetery or with the southernmost rock off the southern extremity of the island, bearing about 251° .

Life-saving.—Life-saving appliances are maintained at Tabarka ; see page 15. 5

Chart 252.

Coast.—**Light.**—From Tabarka, the coast trends about 28 miles north-eastward to Cap Serrat, and as far as Djebel Moruna (Maruna) is low and sandy.

Djebel Moruna is a rocky hill about 3 miles eastward of Tabarka ; 10 between this hill and Djebel Zouara (Zuara), about $9\frac{1}{2}$ miles north-eastward, the coast is backed by well-defined sandhills.

A conspicuous monument is situated about 8 miles eastward ; and two conspicuous monuments are situated, about 2 cables apart, $3\frac{1}{4}$ miles eastward of Île de Tabarka lighthouse. 15

Djebel Zouara is an almost black peak, 715 feet (217^m9) high, about 8 miles south-south-eastward of which Djebel El Msid rises to a remarkable rocky summit, 2,080 feet (637^m0) high, resembling a group of ruins.

Cap Negro, about $3\frac{1}{2}$ miles northward of Djebel Zouara, projects 20 westward from the coast and is not easy to identify. On its southern side is Anse Budmah, and about one mile south-eastward of it Kef Bou Dmah (Budmah) rises to an elevation of 1,562 feet (476^m1), and is a good mark. The coast north-eastward of the cape is rocky and indented, and in it are several short stretches of beach. 25

Anse de Sidi Mechrig (Mishrik) lies about 8 miles north-eastward of Cap Negro (*Lat.* $37^{\circ} 06' N.$, *Long.* $8^{\circ} 59' E.$), and about midway between is Cap Kavansur. This cove can be identified by a small, rocky point, surmounted by a ruin, close within which is a shrine standing on a hillock. 30

Djebel Ech Chitane (Zitana) rises to an elevation of 1,522 feet (463^m9), about 3 miles eastward of Cap Kavansur, and between them Kef En Nsoor rises to a conspicuous conical summit, 1,083 feet (320^m1) high, about half a mile inland.

Between Djebel Ech Chitane and Cap Serrat extends an undulating 35 plain from 200 to 260 feet (61^m0 to 79^m2) high, which slopes gently to the sea ; and behind this plain is a chain of mountains, parallel with the coast. A conspicuous monument stands about $1\frac{1}{4}$ miles north-eastward of Djebel Ech Chitane.

Cap Serrat projects north-eastward and on it are three hills of equal 40 elevation. About $4\frac{1}{4}$ miles southward of the cape, Kef Kralém (Jebel Zelzla), with a jagged crest, rises to an elevation of 889 feet (270^m7), and about one mile east-south-eastward of this hill, Djebel El Hamar (Ahmar), a large rounded hill, rises to an elevation of 1,132 feet (345^m0). 45

A light is exhibited, at an elevation of 617 feet (188^m1), from a tower, the upper part of which is painted black and the lower part white, surmounting a white rectangular dwelling, 43 feet (13^m1) in height, situated on Cap Serrat. A disused signal station stands near the lighthouse. 50

Anchorage.—Anse Budmah is sheltered from winds from north-north-west, through east, to south, but the holding ground is only moderately good, and the northern side of the bay is fringed with rocks. Small vessels, with local knowledge, can obtain anchorage

Charts 165, 160, 2158a.

Chart 252.

in the only part of the bay where the bottom is not rocky, in a depth of 3½ fathoms (6^m9), sand, with Cap Negro bearing 280°.

Anse de Sidi Mechrig affords precarious anchorage to small vessels, with local knowledge, somewhat sheltered from westward by a reef extending a short distance offshore.

Out-lying islands and dangers.—**Light.**—Within 27 miles of the coast between Cap Tabarka and Cap Serrat lie Île de la Galite and several islets and rocks. The channel between these islets and rocks and the coast is deep and is known as Canal de la Galite (Galita channel).

Écueil des Sorelles, the south-westernmost dangers, consist of two rocky patches on each of which there is a rock with a depth of less than 6 feet (1^m8). The western patch lies about 25½ miles north-westward of Cap Negro; the eastern patch lies three-quarters of a mile east-north-eastward of the western. Strong currents are experienced near these rocks.

Écueil des Sorelles are covered by the *red* sector of the auxiliary light on Galitons de l'Ouest, between the bearings of 064° and 069°, but the eastern patch lies very close to the southern edge of the sector.

Galitons de l'Ouest, bearing more than 076° and open southward of Île de la Galite, lead 2½ miles northward of Écueil des Sorelles. See view A on chart 252.

L'Aiguille in line with the summit of Île de la Galite, bearing 048°, leads about 4½ miles south-eastward of Écueil des Sorelles, see view B on chart 252.

Galitons de l'Ouest, about 22 miles north-westward of Cap Serrat, consist of two islets lying close north-westward and south-eastward of one another, named, respectively, Galiton and La Fauchelle. They are fringed with rocks extending a short distance in places, and there is a 3½-fathom (6^m9) patch about 3 cables northward of Galiton. L'Aiguille is a prominent cone, 449 feet (137^m0) high, at the south-eastern end of La Fauchelle (*Lat.* 37° 29' N., *Long.* 8° 54' E.).

A light is exhibited, at an elevation of 551 feet (167^m0), from a small, white tower with a black lantern, surmounting a grey building, 46 feet (14^m0) in height, situated on the summit of Galiton. An auxiliary light is exhibited, at an elevation of 525 feet (160^m0), from a hut at the foot of the main lighthouse.

Île de la Galite is situated with Pointe de Mistral, its western extremity, about 1½ miles north-eastward of Galiton. The coasts of this island are very steep, and it is easily accessible only on its north-western side and in a bay in its southern side about 7 cables north-westward of its south-eastern extremity. The western part of the island rises to a summit 1,289 feet (392^m9) high, on which stands a green look-out hut. At the south-eastern extremity of the island Piton de l'Est, a prominent conical peak, rises to an elevation of 1,175 feet (358^m1). The northern side of the island is foul in places for about 2 cables offshore, but its southern side is comparatively steep-to. Two radio masts near the centre of the island show up well from southward.

Galitons de l'Est consist of three rocks named, from north to south, Gallo, Polastro, and Gallina. Gallo, the highest, is 371 feet (113^m1) high and lies about one mile north-north-eastward of the northern extremity of Île de la Galite; shoals with depths of less than 5 fathoms

Charts 165, 160, 2158a.

Chart 252.

(9^m1) lie within one mile northward of Gallo, Basse du Nord, the northernmost shoal, having a depth of 3½ fathoms (5^m9).

Off-lying banks.—Banc des Mazzarilles, a rocky bank with depths of from 11 to 19 fathoms (20^m1 to 34^m8), lies about 8 miles northward of Île de la Galite. 5

Banc de la Sentinelle, with a least known depth of 47 fathoms (86^m0), coral, lies about 45 miles north-eastward of Île de la Galite.

Anchorage.—Owing to the depths off the southern side of Île de la Galite, vessels must anchor close inshore. The best berth is in the bay on that side, with the western entrance point of the latter in line with the pass between Galiton and La Fauchelle, bearing about 240°, and Piton de l'Est in line with the centre of a white cliff, between two small stony beaches on the eastern side of the bay; the bottom is covered with weed, and the holding ground is good. A considerable swell may occur with any direction of wind; the bay is open to southerly winds, but these are infrequent, and, except in winter, usually light. 15

There is a mooring buoy, for the use of vessels up to 300 tons, in the western part of the above-mentioned bay, in a depth of about 9 fathoms (16^m5); another mooring buoy is situated in the centre of the bay, in a depth of 6½ fathoms (11^m9). 20

In fine weather, temporary anchorage can be obtained, by small vessels with local knowledge, in a small bay with a sandy beach, on the northern side of Île de la Galite, in depths of from 4½ to 5½ fathoms (7^m8 to 9^m6), sand. 25

Coast.—Dangers.—The eastern side of Cap Serrat is faced with cliffs which diminish in height, for about 1½ miles southward, to a sandy beach at the head of a bay, and from the head of this bay the coast trends east-north-eastward. 30

Djebel Blida (Leblidah), about half a mile inland and 3 miles south-eastward of Cap Serrat (*Lat.* 37° 15' N., *Long.* 9° 13' E.), has three conical summits and is about 800 feet (243^m8) high.

Djebel Loka (Loko), a conical hill 415 feet (126^m5) high, lies about three-quarters of a mile inland 5 miles east-north-eastward of Djebel Blida. Between them the coast is rocky. 35

Chart 1381.

Ras El Goléa (Aluglea), about 1½ miles north-north-eastward of Djebel Loka, is a rocky point at the north-eastern end of a sandy beach. From this point, the coast trends about 8½ miles east-north-eastward to Ras al Dukara; it is backed by mountains and is mostly cliffy, but there is a sandy beach near its centre. 40

Chart 252.

Anchorage.—Small vessels with local knowledge can obtain anchorage, sheltered from westerly and north-westerly winds, in the bay, on the eastern side of Cap Serrat, with a remarkable projection, consisting of large symmetrical blocks, piled one on the other, about one mile south-south-eastward of the cape, bearing 337° and distant about one cable; there are depths of from 3½ to 4½ fathoms (6^m9 to 7^m8) fairly close inshore, but the holding ground is only moderately good. Landing can be effected at a small jetty. 45

Anchorage can also be obtained by small vessels with local knowledge in a cove between a rock off the mouth of Oued Guemgoum (Wad Rinane), about 2 miles south-eastward of Cap Serrat, and a small

Chart 252.

peninsula close eastward of it, in depths of from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms (5^m0 to 5^m9).

Chart 1381.

- 5 **Off-lying rocks.**—Les Fratelli, lying about $2\frac{1}{2}$ miles north-north-eastward of Ras El Goléa, are two rocks, 131 and 302 feet (40^m9 and 92^m0) high, respectively. Rocks extend from the eastern and higher rock towards a detached $2\frac{1}{2}$ -fathom (5^m0) patch about 4 cables north-north-eastward of it. These dangers are covered by the *red* sector of
10 the light on Cap Serrat, between the bearings 238° and 261° , and by that of Ras Enghela, when bearing less than 085° .

Coast.—Dangers.—Light.—Ras al Dukara can be identified by its irregular crest which rises in cliffy steps from the sea, and about 3 miles south-westward of it Sidi Chiha (Kef Dbā), with two separate
15 masses of rock at its summit, attains an elevation of 1,358 feet (413^m9). The coast eastward of the cape is backed by mountains and consists of low cliffs and rocks, with here and there a sandy beach.

Ras el Korane (al Koran), about $5\frac{1}{2}$ miles east-north-eastward of Ras al Dukara, consists of flat grey rocks, with some detached low rocks
20 within half a mile north-westward of it. It is bordered by foul ground, and should be given a wide berth. A conspicuous, white, round tower stands close to the coast, at an elevation of 472 feet (143^m9), about one mile east-south-eastward of Ras el Korane.

The coast eastward of Ras el Korane is fringed with cliffs followed
25 by a low plateau bordered with dunes and a few hillocks.

Ras Enghela is formed by the above-mentioned plateau, and about 2 miles southward of this point is Djebel Daouda (Daonda), 912 feet (278^m0) high, with a ruin on its summit. The point is fringed with rocks and shoals extending about three-quarters of a mile offshore,
30 and should be given a wide berth.

A light is exhibited, at an elevation of 123 feet (37^m5), from a white square tower surmounting a white dwelling, 49 feet (14^m9) in height, on Ras Enghela. Close to the lighthouse are the ruins of a square tower.

- 35 From Ras Enghela, the coast trends eastward for about 4 miles to Cap Blanc, and consists of a sandy beach followed by dunes, which latter are succeeded by cliffs, gradually rising in elevation towards Cap Blanc. Djebel Sba attains an elevation of 656 feet (199^m9) about 2 miles south-south-westward of Cap Blanc.

40 **BIZERTA AND APPROACHES. — Coast. — Dangers. — Beacons.—Buoys.**—Baie de Bizerte is entered between Cap Blanc and Cape Zebib, about 12 miles east-south-eastward.

Cap Blanc (*Lat.* $37^\circ 20' N.$, *Long.* $9^\circ 50' E.$) is a narrow projection, extending northward from the coast, the seaward sides of which consist
45 of vertical white cliffs. A conspicuous signal station stands, at an elevation of 820 feet (249^m9), about half a mile southward of the cape.

Chart 1569.

- Cap Bizerte (Guardia), on which are three small but prominent peaks, lies about $1\frac{1}{4}$ miles east-south-eastward of Cap Blanc, and from
50 it the low coast trends about $3\frac{1}{4}$ miles southward to the harbour at Bizerta. A conspicuous beacon stands about $1\frac{1}{2}$ cables southward of Cap Bizerte. The northern part of this stretch of coast is bordered by small cliffs fringed with rocky flats; its southern part is sandy.

Charts 250, 165, 2158a.

Chart 1569.

A bank, with depths of less than 18 feet (5^m5), extends as much as one-quarter of a mile off this stretch of coast in places.

Banc du Boberak or Sidi Salem, with depths of less than 6 feet (1^m8), extends 4 cables from the coast about 2½ miles southward of Cap Bizerte. 5

Djebel Kebir, which overlooks the town of Bizerta, rises to an elevation of 909 feet (277^m1) about 2½ miles south-westward of Cap Bizerte.

The town of Bizerta, called by the French Bizerte, lies on the coast 10 3½ miles southward of Cap Bizerte and on the north-western side of the channel leading to Lac de Bizerte. There are also a few scattered houses forming the village of Zarzouma on the south-eastern side of the channel. The oil tanks half a mile south-eastward of the town, the belfry of the barracks at Bijouville, the church and the white 15 dome of the municipal buildings in the centre of the town, the home for the aged at Koudia, three-quarters of a mile north-westward of the town, and the large white silo near the railway goods station are all prominent marks. A signal station is established at Koudia. 20

About two miles south-westward of the town lies the village of La Pecherie, containing a number of French Naval offices and living quarters.

Eastward of the town, a sandy beach extends for about 2½ miles. A conspicuous beacon stands about 3½ cables inland 3½ miles east- 25 south-eastward of Bizerta.

Charts 1569, 1381.

A torpedo range, marked by two lines of buoys, which are withdrawn during the winter months, is situated off the southern shore of Baie de Bizerte, from half a mile to one mile offshore. 30

Chart 1381.

From the eastern end of the above-mentioned beach, the coast forming the southern shore of Baie de Bizerte trends about 6½ miles east-north-eastward to Cap Zebib, *see* page 336. It is rocky and backed by hills. 35

Harbour.—Lights.—The harbour at Bizerta consists of Avant-Port and Vieux-Port. The former is protected by Jetée Nord, extending about 6½ cables eastward from the citadel; Jetée Est extending north-north-eastward from the shore to a position about 2 cables southward of the head of Jetée Nord; and by a detached breakwater. 40 A channel leads from Avant-Port to Lac de Bizerte, and the French Naval base at Sidi Abdallah, Ferryville. In 1948, vessels not exceeding 560 feet (170^m7) in length and 100 feet (30^m5) beam, drawing up to 27 feet (8^m2), could enter the harbour.

Chart 1569.

A light (*Lat.* 37° 17' N., *Long.* 9° 53' E.) is exhibited, at an elevation of 49 feet (14^m9), from a green tower, 26 feet (7^m9) in height, situated on the head of Jetée Nord. 45

A light is exhibited, at an elevation of 79 feet (24^m0), from a black and white tower, situated on the head of Jetée Est. 50

A light is exhibited, at an elevation of 49 feet (14^m9), from a red tower, 26 feet (7^m9) in height, situated on the north-western head of the detached breakwater.

A light is exhibited, at an elevation of 48 feet (14^m6), from a black

Charts 250, 165, 2158a.

Chart 1569.

tower, 26 feet (7^m9) in height, situated on the south-eastern head of the detached breakwater.

About one cable southward of the head of Jetée Est is an oiling berth across floating pontoons lying parallel with the jetty, about half a cable westward of which lies a warping buoy. Vessels drawing up to 29 feet (8^m8) can berth here. There are bollards on the jetty southward of the oiling berth to which vessels can secure their sterns, with anchors laid out north-westward; similarly there are bollards on Jetée Nord to which vessels can secure with anchors laid out southward.

In 1947, there was a depth of 28 feet (8^m5) in the channel in Avant-Port; elsewhere in this basin there were depths of from 18 to 42 feet (5^m5 to 12^m8). Except in the channel leading to Lac de Bizerte, the depths are shoal within 1½ cables of the south-western side of the harbour, which part is liable to silting. A sunken wall, with depths of less than 3 feet (5^m9), extends about one cable south-south-eastward from a position about 1½ cables southward of the root of Jetée Nord. Two mooring buoys are situated in the north-western part of Avant-Port.

Vieux-Port, the entrance to which lies between two conical buoys in the north-western corner of the Avant-Port, close southward of the root of the northern jetty, is available to vessels drawing up to 9 feet (2^m7). An obstruction, with a depth of 5 feet (1^m5), marked by a conical buoy, lies close to the northern shore about half a cable inside the entrance. The port is quayed throughout, but the berths alongside are shoal and, in places, dry. There are three jetties on the northern side of the entrance, suitable for barges.

Anchorage.—Caution.—The anchorage in Baie de Bizerte is more sheltered and the holding ground is better than at the other open anchorages off the northern coast of Tunisia. Large vessels can obtain anchorage, sheltered from north-westerly winds, in depths of 8 or 9 fathoms (14^m6 or 16^m5), about three-quarters of a mile eastward of Fort Sidi Salem, but the position is exposed to winds from between north and east. Small vessels, if not intending to enter the lake or the channel leading to it, should always take shelter in Avant-Port.

Anchorage is prohibited in an area, eastward of Fort Sidi Salem (*Lat.* 37° 17' N., *Long.* 9° 52' E.), the eastern and southern limits of which are indicated by pecked lines on the chart, on account of submarine telegraph cables, *see* page 19. A buoy, the top part painted yellow and the bottom part black, is moored on the eastern boundary of this area about 9½ cables northward of the head of Jetée Nord.

Anchorage is prohibited within 2 cables of the buoys marking the torpedo range east-south-eastward of the harbour.

Submarines are prohibited from diving in an area southward of the parallel of the south-eastern head of the detached breakwater, bounded westward by the meridian of that head and eastward by an imaginary line drawn parallel with the western boundary and 1½ miles eastward of it.

Avant-Port was not, in 1943, used as an anchorage for large vessels, as there was insufficient swinging room when ships were berthed, stern-on, at the northern jetty. Vessels with powerful condenser water circulating pumps berthed near the northern jetty may experience trouble through their condensers becoming choked with seaweed.

Charts 1381, 250, 165, 2158a.

Chart 1569.

Cavalier Nord, *see* page 340, has a small quay on its northern side and a small pier on its north-western side : in the middle of its northern side is a boat camber and there is a wooden pier about a quarter of a cable northward of its root (*Lat.* 37° 16' N., *Long.* 9° 53' E.). 5

Caution.—The northern entrance to Avant-Port is considered, locally, to be dangerous for large or single-screw ships entering against the ebb stream, on account of a strong easterly set off the northern jetty.

The detached breakwater should be given a wide berth as it slopes 10 under water for about 120 feet (36^m6); the northern end of Jetée Est should also be given a good berth on account of masonry debris lying off it.

Tidal streams.—Signals.—In Avant-Port, the flood stream makes along Jetée Est and flows round the Cavalier Sud, *see* page 340, into 15 Canal de Bizerte. The ebb stream sets over towards the head of Jetée Nord. Signals indicating the direction of the tidal stream are displayed from a flagstaff on the signal station at the root of the Cavalier Nord, as follows :—

Flood stream.—A cone point up. 20

Ebb stream.—A cone point down.

The stream flows up and down the channel, except in the vicinity of obstructions. When running strongly, a considerable set northward is experienced in the vicinity of the signal station, whilst a secondary stream through the 14-foot (4^m3) boat channel, on the southern side of 25 the obstructions, meets the main stream near the port-hand outer light-buoy, increasing the northerly set on the ebb and decreasing it on the flood.

In Goulet du Lac the tidal stream is confined chiefly to the dredged channel and is weak in the bays and along the coast except where the 30 dredged channel passes close to the shore.

It is advisable to enter the harbour on the first or last of the ebb, and to leave on the first or last of the flood. The out-going stream begins about 4 hours after low water, and the in-going stream about 3½ hours after high water at Gibraltar, which times should be regarded 35 as very approximate. The stand of the stream is often of only a few minutes' duration but may last as much as an hour or more.

The local authorities, who should be consulted before arriving at or leaving the port, publish a monthly memorandum giving details of the tidal streams and tidal and traffic control signals. 40

Pilotage.—Pilotage is compulsory within the harbour entrance; *see* page 20. The pilot station is on the north-western side of the entrance to Canal de Bizerte. To avoid delay a vessel should show the signal for a pilot in good time.

Signals.—Signals regulating entrance and exit (*see* page 14) are 45 shown from a flagstaff near the root of Cavalier Nord.

Storm signals, *see* page 12, are shown, but only when the velocity of the wind is expected to exceed 20 knots.

When dredging is in progress, dredgers will, by day, display the following signals :— 50

Flag W of the International Code of Signals : Channel closed.

A pennant above a ball : Channel clear, pass northward.

A pennant below a ball : Channel clear, pass southward.

Charts 1381, 250, 165, 2158a.

Chart 1569.

At night dredgers will exhibit the following signals:—

Two *red* lights, disposed vertically: Channel closed.

A *white* light above a *red* light: Channel clear, pass northward.

- 5 A *red* light above a *white* light: Channel clear, pass southward.

A vessel wishing to use the channel should sound *three long* blasts on the whistle or siren, and should not attempt to pass the dredger until the "Channel clear" signal is shown.

Climatic table.—See page 56.

- 10 **Canal de Bizerte.**—**Lights.**—This channel leads from Avant-Port to Baie de Sebra and Goulet du Lac. Except close along either side, this channel, in 1948, had been dredged to a depth of 39 feet (11^m9), and is entered from Avant-Port between two jetties named Cavalier Nord and Cavalier Sud.

- 15 A light is exhibited, at an elevation of 15 feet (4^m6), from the head of Cavalier Nord, and a similar light is exhibited from the head of Cavalier Sud (*Lat.* 37° 16' N., *Long.* 9° 53' E.).

A light is exhibited, at an elevation of 13 feet (4^m0), from a niche in the detached breakwater on the prolongation of the axis of the channel, showing white for 4° on either side of that line between the bearings of 051° and 059°.

- 20 A light is exhibited, at an elevation of 15 feet (4^m6), from the south-western end of the northern shore of Canal de Bizerte.

- 25 A light is exhibited, at an elevation of 15 feet (4^m6), from the south-western end of the southern shore of Canal de Bizerte.

The light on Pointe de Sebra, *see* below, exhibits a *white* sector, between the bearings of 234° and 235°, along the axis of Canal de Bizerte.

- 30 Quai Transatlantique, which has depths of 30 feet (9^m1) alongside, lines the northern side of Canal de Bizerte, opposite Zarzouna. It is 1,300 feet (396^m2) long.

South-westward of the Quai Transatlantique, the northern side of the channel is shoal, and obstructions exist between here and the silo at the entrance to Baie de Sebra.

- 35 Vessels cannot secure to the southern side of the channel owing to shoal depths, except at the watering berth near the south-western end of the channel, where there is a depth of 20 feet (6^m1) outside a barge at which vessels berth, close westward of a prominent minaret in Zarzouna.

- 40 **Regulations.**—Speed of vessels in the channel must not exceed 5 knots over the ground: speed must not exceed 6 knots between No. 3 mooring buoy and No. 18 light-buoy.

- 45 **Baie de Sebra.**—**Dangers.**—**Light.**—**Buoyage.**—Baie de Sebra is entered between the silo on the northern side and Pointe de Sebra south-westward. Anchorage is available, in a depth of from 24 to 30 feet (7^m3 to 9^m1) near the entrance to the bay, for vessels not exceeding 420 feet (128^m0) in length, but vessels should approach at minimum speed.

- 50 There are two berths, where vessels can secure alongside, in the bay:—the berth formed by two spur jetties opposite the silo building, with a least depth of 25 feet (7^m6) over a length of 400 feet (121^m9), which should be approached with the minaret in Zarzouna bearing 082°, and the coaling wharf near the western end of the bay, close southward of a prominent chimney, which has a least depth of 21 feet (6^m4) over a length of 320 feet (97^m5).

Charts 1381, 250, 165, 2158a.

Chart 1569.

A light is exhibited, at an elevation of 52 feet (15^m8), from a white, iron tower, with a black band around the upper part, 49 feet (14^m9) in height, situated on Pointe de Sebra.

A shoal bank extends about one cable northward and southward 5 and about half a cable eastward of Pointe de Sebra. There is a sea wall of loose rubble along the eastern and southern edges of this bank.

No. 11 conical light-buoy, painted black, surmounted by a cone and exhibiting a *green flashing* light *every two seconds*, is moored about three-quarters of a cable south-eastward of Pointe de Sebra. No. 12 10 can light-buoy, painted red, surmounted by a cylinder and exhibiting a *red fixed* light, is moored about 2 $\frac{3}{4}$ cables eastward of Pointe de Sebra. A red can buoy, moored about 2 cables north-eastward of No. 12 light-buoy, marks the edge of the shoal bank on the eastern side of the channel. 15

Goulet du Lac.—Buoyage.—The main channel of Goulet du Lac was dredged, in 1939, to a depth of 39 feet (11^m9) as indicated by pecked lines on the chart. Anchorage, with good holding ground, is available for large vessels south-eastward of Pointe de Sebra, off the Quai de la Carrière and in the Baie des Carrières. There are several 20 mooring buoys in the vicinity. The channel is buoyed; buoys on the northern side are painted red, those on the southern side black.

Outer part.—Dangers.—Buoyage.—On the north-western side of the channel, No. 13 conical light-buoy, painted black and white in chequers and exhibiting a *green fixed* light, is moored off the southern 25 end of Banc de Sidi Salah, which extends about 2 $\frac{1}{4}$ cables south-eastward from Pointe de l'Amirauté (*Lat. 37° 15' N., Long. 9° 51' E.*) and has a depth of 7 feet (2^m1).

A white conical buoy, moored about 2 cables north-eastward of No. 13 light-buoy, marks the edge of the dredged channel. 30

The coast between Pointe de Sebra and a quay about 8 cables west-south-westward is low and wooded; the quay mentioned above has depths of from 11 to 13 feet (8^m4 to 4^m0) alongside. A buoy lies about half a cable south-westward of the quay. The coast as far as Pointe de l'Amirauté, about 3 $\frac{1}{2}$ cables farther south-westward, is 35 fringed by a sandy beach, which is fronted by a shoal bank extending from one to 2 cables offshore.

From the western end of Canal de Bizerte the south-eastern shore of the channel trends southward and eastward to Pointe du Palmier. No. 12 light-buoy, described above, marks the western limit of the 40 shoal bank extending from the south-eastern shore. This shoal bank extends about 1 $\frac{1}{2}$ cables offshore southward of the light-buoy and as far as Pointe du Palmier. Several rocks, with depths of less than 6 feet (1^m8), lie within 1 $\frac{1}{2}$ cables of Pointe du Palmier. The shore between Pointe du Palmier and Pointe de la Carrière is fringed 45 with rocky cliffs and is higher than elsewhere, but it is steep-to to within half a cable.

Quai de la Carrière consists of seven spur jetties, numbered 1 to 7 from eastward, and lies close northward of Pointe de la Carrière. There are depths of 30 feet (9^m1) at the heads of these jetties. Fuel 50 oil is laid on to the heads of Nos. 1 and 2 jetties.

North-westward of Quai de la Carrière and on the northern side of Pointe de la Carrière are three small spur jetties forming a coaling wharf, about half a cable north-eastward of which is a mooring buoy.

Charts 1381, 250, 165, 2158a.

Chart 1569.

No. 16 can light-buoy, painted red and exhibiting a *red fixed* light, is moored about $2\frac{1}{2}$ cables north-westward of Pointe de la Carrière ; between the light-buoy and the point the depths are very shoal.

5 Passage is prohibited between them.

Inner part.—Light.—Buoyage.—Dangers.—Beacons.—Baie de Karouba, on the north-western side of the channel, is entered between Ras el Kram (Krem) and Pointe Karouba (*Lat. $37^{\circ} 15' N.$, Long. $9^{\circ} 50' E.$*), about 4 cables west-south-westward. Its shores are
10 bordered by a shoal bank, but there are depths of from 18 to 30 feet (5^m5 to 9^m1) in the centre of the bay. A shoal, with a depth of 10 feet (3^m0), lies about $1\frac{1}{2}$ cables eastward of Pointe Karouba, and depths of less than 6 feet (1^m8) extend about three-quarters of a cable southward of that point.

15 No. 15 conical light-buoy, painted black, surmounted by a cone and exhibiting a *green group flashing* light, showing *three flashes every fourteen seconds*, is moored about one cable south-south-westward of Ras el Kram (*Lat. $37^{\circ} 15' N.$, Long. $9^{\circ} 50' E.$*).

A white beacon, 10 feet (3^m0) high, stands on Pointe Karouba.
20 Baie Ponty is entered between Pointe de l'Amirauté and Pointe de la Direction du Port about $1\frac{1}{2}$ cables south-westward. There are jetties for small craft in the bay ; the two most westerly have, at their heads, depths of at least 19 feet (5^m8) over a length of 200 feet (61^m0). Two lights, which, in line, bear 324° , lead towards the entrance
25 to Baie Ponty ; they are exhibited on the north-western side of the bay. A light is exhibited from the head of a pier close northward of Pointe de l'Amirauté.

Three black conical buoys mark the edge of the shoal bank on the northern side of the entrance to Baie Ponty, north-westward of No. 13
30 light-buoy.

La Pecherie village is situated northward of Baie Ponty and the Naval dockyard extends from this bay southward to Ras el Kram. Pointe de la Direction du Port (l'Infirmierie), which has four quays, provides good berths for large vessels on its eastern and southern
35 faces where there are depths of from 24 to 30 feet (7^m3 to 9^m1) ; there is a depth of about 18 feet (5^m5) off the western quay.

Baie de Seti Meriem is entered between Pointe de la Direction du Port and Ras el Kram, about $3\frac{1}{2}$ cables south-westward. A radio mast stands on its shores. It has an oiling berth with a depth of
40 33 feet (10^m1).

A shoal, with a depth of 31 feet (9^m4), lies about $1\frac{1}{2}$ cables north-eastward of Ras el Kram. A beacon marks a rock, which dries close north-westward of Ras el Kram, and another, surmounted by a triangle, stands on the point.

45 Anse de Menzel Smail is entered between Pointe Karouba and the south-eastern extremity of Île Srira, about $3\frac{1}{2}$ cables south-south-westward. It is quayed on its northern side, where there is a spur jetty and a slipway. There are depths of 11 feet (3^m4) alongside the northern side. The south-western shore of this bay, northward of
50 the south-eastern extremity of Île Srira, is bordered by a bank, which, with depths of less than 18 feet (5^m5), extends as much as a cable offshore. Île Srira is a tract of low ground under reclamation, in 1943, and surrounded by a rubble sea-wall.

A light is exhibited from a position near the south-eastern extremity
55 of Île Srira.

Charts 1381, 250, 165, 2158a.

Chart 1569.

Baie des Carrières, on the south-eastern side of the channel, is entered between Pointe de la Carrière and Pointe du Chacal, about 9 cables south-westward. Near the head of the bay is a rocky hillock about 100 feet (30^m5) high, near which are two landing places. Depths in the bay, in which there are several mooring buoys, are from 30 to 42 feet (9^m1 to 12^m8), to within a cable of the coast, except for a bank with depths of less than 18 feet (5^m5), which extends about 2 cables northward from the southern shore of the buoy.

No. 18 can light-buoy, painted red and exhibiting a *red fixed* light, is moored on the eastern side of the fairway about 2 cables north-westward of Pointe du Chacal. This light-buoy marks the north-western limit of a rocky shoal extending from the point. Vessels should not attempt to pass between the light-buoy and the point.

Baie de Bellaouidet, on the north-western side of the channel, is entered between Île Srira and Pointe du Douar, about half a mile south-westward. A narrow channel, with depths of 18 feet (5^m5), leads a short distance into the bay, in which there are some mooring buoys. A spit, with depths of less than 6 feet (1^m8), parts of which dry, extends about 3½ cables eastward of Pointe du Douar; its eastern extremity is marked on its southern side by No. 17 conical light-buoy, painted black and exhibiting a *green occulting* light every two seconds.

No. 20 can light-buoy, painted red and exhibiting a *red fixed* light, is moored on the eastern side of the channel about 1½ cables westward of Ras el Gueblaoui (Keblau), which point lies about 3½ cables southward of Pointe du Chacal. No. 19 conical light-buoy, painted black and exhibiting a *green fixed* light, marks the western side of the channel about 2½ cables westward of Ras el Gueblaoui.

The land northward of Ras el Gueblaoui is densely covered with olive groves and is low. Ras ech Charaa (Shara point) lies between Pointe du Chacal and Ras el Gueblaoui, about one cable south-westward of the former.

Lac de Bizerte.—Dangers.—Buoyage.—The western shore of this lake is low and marshy, and is fringed by a bank, with depths less than 18 feet (5^m5). The beacon on Pointe Karouba in line with Pointe ech Charaa, bearing 017°, leads over the eastern edge of this bank. A red spindle buoy is moored on the edge of the bank about one mile south-eastward of Pointe des Grèbes, the south-eastern extremity of Djezira el Krira. The outer part of the shore bank, with depths of less than 30 feet (9^m1), on this side of the lake is covered by the *red* sector of the light near the root of the northern jetty at Sidi Abdallah, between the bearings of 184° and 204°.

A channel, indicated by pecked lines on the chart, has been dredged through the lake; in 1948, it had a least depth of 39 feet (11^m9). It extends, with a width of one cable, to the buoyed channel at the entrance to the harbour at Sidi Abdallah.

A can light-buoy, painted red and white in vertical stripes, surmounted by a T and exhibiting a *white quick flashing* light, every two seconds, is moored, on the eastern side of the dredged channel, about 1½ miles east-south-eastward of Pointe des Grèbes (*Lat.* 37° 13' N., *Long.* 9° 48' E.).

Oued Tindja flows from Lac Ichkeul (Ishkel) into Lac de Bizerte, about 2 miles south-south-westward of Pointe des Grèbes.

Charts 1381, 250, 165, 2158a.

Chart 1569.

The northern shore of Lac de Bizerte is backed by hills, amongst which are Djebel Touila (Tuila), 252 feet (76^m8) high, and Djebel Ain es Saфра, 272 feet (82^m9) high. South-westward and south-eastward of Djebel Touila lie, respectively, the large village of Menzel Abd er Rahmane (Abderrahman) and that of Menzel Djemil; in the former village there is a prominent minaret. The shore between Ras el Gueblaoui and Ras Krabeuch is low and there is a landing place about 4 cables eastward of the former point.

- 10 The shore for about 3½ miles eastward of Menzel Abd er Rahmane is fronted by a bank and some detached shoals, with depths of less than 18 feet (5^m5), extending as much as one mile offshore in places.

The eastern half of the lake has depths less than 30 feet (9^m1), and the shore on that side consists of an extensive marshy plain backed by mountains.

The southern shore of the lake is low, and is backed by hills; in the south-western corner is the dockyard port of Sidi Abdallah.

There is a small harbour for explosives, with a depth in it of 10 feet (3^m0), about three-quarters of a mile north-westward of Sidi Abdallah.

- 20 The depths on the spoil ground eastward of Sidi Abdallah are reported to have shoaled to from 19 to 23 feet (5^m8 to 7^m0).

A light-buoy, for the use of seaplanes, painted blue and white in vertical stripes and exhibiting a *white fixed* light, is moored about 4½ cables eastward of the dredged channel and about 2½ miles north-eastward of the entrance of the harbour at Sidi Abdallah.

A mooring buoy lies about a mile south-eastward of Ras el Gueblaoui, about 3½ cables eastward of a stranded wreck with its masts visible above water.

- A mooring buoy for large vessels lies about a mile north-eastward of the entrance to Sidi Abdallah harbour.

Sidi Abdallah.—Buoyage.—Lights.—This artificial harbour, normally reserved for naval vessels, is protected on three sides by moles and has two entrances; that on the southern side, 70 yards (64^m0) wide and with depths of 10 feet (3^m0), is for small craft only. The main entrance, about half a cable wide, is at the north-eastern corner and is approached by the dredged channel from Bizerta; the least depth in the entrance is 41 feet (12^m5). The dry docks, repair sheds, coaling and other jetties are on the western side of the harbour (*Lat. 37° 09' N., Long. 9° 48' E.*).

- 40 Two light-buoys, one painted red and occasionally exhibiting a *green fixed* light and the other painted black and occasionally exhibiting a *red fixed* light, are moored about 3½ cables north-eastward of the harbour entrance; they mark the approximate limits of the dredged approach channel and a vessel entering the harbour should pass between them.

The graving docks, for particulars of the largest of which, *see* page 486, are in the north-western corner of the harbour.

Southward of the docks are five jetties.

- General depths in the northern part of the harbour are 40 feet (12^m2), shoaling gradually to 27 feet (8^m2) at the southern end. Depths eastward of an imaginary line joining the northern extremity of the detached mole and the southern entrance are generally less than 18 feet (5^m5).

Vessels drawing up to 30 feet (9^m1) can berth alongside the northern

Charts 1381, 250, 165, 2158a.

Chart 1569.

side of No. 2 jetty and both sides of No. 1 jetty or can be berthed, stern-to, between No. 1 jetty and No. 4 dock. Other berths alongside are restricted to vessels drawing less than 18 feet (5^m5).

A small artificial harbour, known as the Pyrotechnic harbour, with depths of from 10 feet to 15 feet (3^m0 to 4^m6) has been constructed about half a mile north-westward of the main harbour to provide small craft with berths alongside.

A light is exhibited from the northern side of a minaret near the root of the northern jetty at Sidi Abdallah. In 1949, this light was extinguished.

Lights are exhibited from iron framework pylons, one on either side of the entrance of the harbour. In 1949 these lights were extinguished.

Leading lights are exhibited, the front one from a beacon on the western side of the harbour, and the rear one from a tall chimney in the south-western part of the dockyard. These lights in line bearing 235° lead up to the entrance to the harbour; but in 1949 they were extinguished.

Pilotage.—Pilotage is compulsory. A vessel should anchor in the roadstead outside the piers whilst awaiting the pilot boat. Large vessels can only enter or leave by day, preferably at or near slack water.

Ferryville.—This town is situated close westward of the harbour of Sidi Abdallah. Its resources are small.

Port facilities.—Repairs of all kinds can be executed. There are a number of cranes, including a 20-ton floating crane. There is a hospital.

Fresh provisions can be procured. Water is laid on to the quays.

For radio communication, *see* page 21.

Chart 1381.

COAST.—Caution.—Beacon.—Cap Zebib, *see* page 336 and view on chart 250, can be identified by two conical hills on it, about 310 feet (94^m5) high, and by a conspicuous beacon situated about 2½ cables south-westward of it. Its extremity is low and foul for about one-quarter of a mile offshore. It is backed by high land, on the summit of which stands Sidi Bou Choucha (Bu Chucha). At the head of a bay on the eastern side of the cape is a small fishing harbour protected by two jetties. Tunny nets, *see* page 27, are laid out annually in the vicinity of Cap Zebib (*Lat.* 37° 16' N., *Long.* 10° 01' E.).

From Cap Zebib the coast trends about 11½ miles east-south-eastward to Cap Farina, and is backed in places by dunes.

Chart 1381, plan of Cap Farina anchorage.

Sidi Guebbari (Gabari) is a good mark; it surmounts a large sand-hill close to the coast about 2½ miles south-eastward of Cap Zebib (chart 1381).

Ras el Djebel (Jebel) is a large village, with four conspicuous minarets in it, situated on a hill about 1½ miles south-eastward of Sidi Guebbari.

Djebel Faouara rises to an elevation of 869 feet (264^m9), about 1½ miles southward of Ras el Djebel.

Djebel Fartas consists of two prominent cones, 393 and 321 feet (119^m8 and 97^m8) high, respectively, surmounting a point about 3 miles eastward of Ras el Djebel. There is a coastguard station on

Charts 250, 165, 2158a.

Chart 1381, plan of Cap Farina anchorage.

the point. See view facing this page. A minaret is situated about half a mile west-north-westward of Djebel Fartas.

- From Djebel Fartas, the coast as far as the mouth of Oued Namuna, about one mile south-eastward, is rocky, and from the mouth of the river, a sandy beach extends about $1\frac{1}{4}$ miles south-eastward, whence, to Cap Farina, the coast is rocky.

- Djebel Nadour (Nadur) rises to an elevation of 1,096 feet (334^m1), about $1\frac{1}{4}$ miles southward of Djebel Fartas; see view facing this page. It is the summit of a chain of hills, which descends towards Cap Farina, and on it is a signal station, consisting of a white, round tower and dwelling, surmounted by a mast, but it is not open for public communication. About midway between Djebel Nadour and Djebel Fartas is the village of Raf Raf, in which there is a conspicuous minaret.

Cap Farina, see view facing this page, is the extremity of a narrow promontory, and is easy to identify. Sidi Aliel Meki is situated, on the southern side of the promontory, about 2 cables westward of the cape; a fort stands about 8 cables farther west-south-westward.

- Oued Medjerda (Mejerda) flows into the sea about $4\frac{1}{4}$ miles south-south-westward of Cap Farina, forming a low delta fringed by a shoal bank, which is constantly extending eastward; vessels should keep eastward of the meridian of the cape when in its vicinity. The bay between Cap Farina and the mouth of Oued Medjerda has general depths of from 18 to 60 feet (5^m5 to 18^m3), but depths of less than 18 feet (5^m5) extend about one mile from its head, where lies the entrance to Lac de Porto Farina, a shallow lagoon. Porto Farina lies on the northern side of the lagoon.

Chart 1381.

- Off-lying islets and dangers.—Lights.—Buoy.**—Îles Cani, 59 and 66 feet (18^m0 and 20^m1) high, respectively, lie about 6 miles north-north-eastward of Ras Zebib. On their south-eastern sides they are steep and cliffy, but their north-western sides slope gently to the sea and are fringed with flat rocks. They lie on a rocky bank, which extends about $1\frac{1}{4}$ miles north-eastward and south-south-westward from them.

- A light (*Lat.* $37^{\circ} 21' N.$, *Long.* $10^{\circ} 08' E.$) is exhibited, at an elevation of 129 feet (39^m3), from a black tower with white horizontal bands on a square base, 70 feet (21^m3) in height, situated on the summit of the south-eastern and higher of Îles Cani.

A spindle buoy, painted red and white in horizontal bands, surmounted by two cones, points down and marked "Cani," is moored off the south-western end of the bank about $1\frac{1}{4}$ miles south-south-westward of the lighthouse.

- A detached rocky bank, with a depth of 56 feet (17^m1), lies about $3\frac{3}{4}$ miles westward of Îles Cani.

A rocky bank, with a depth of 48 feet (14^m6), lies about 15 miles eastward of Îles Cani.

Chart 1381, plan of Cap Farina anchorage.

- Île Pilau, conical and 377 feet (114^m9) high, lies about one mile offshore 2 miles north-westward of Cap Farina; it is free from off-lying dangers. See view facing this page.

There are several rocky shoals, with depths of less than 30 feet (9^m1), within $1\frac{1}{4}$ miles north-eastward of Cap Farina. Of these the

Djebel Aissa.



Cap Roux,
bearing 177°, 25 miles.

a



Monte
Rondo.

View, in two parts, of Cap Roux from northward.
(Original dated 1934.)

Cap Gros.

a



Ile Plate.

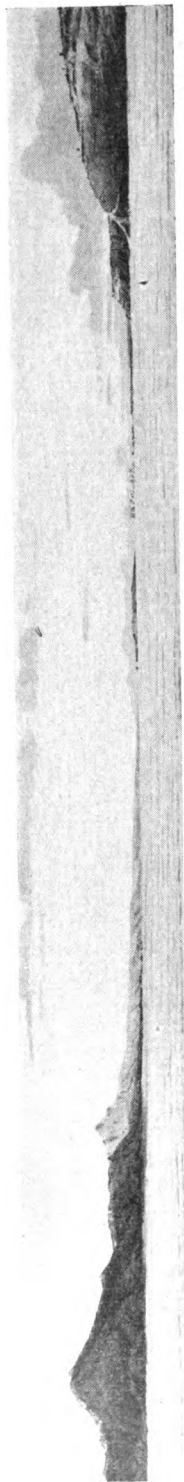
Cap Farina, bearing 192°,
distant 4 miles.

Cap Farina from northward.
(Original dated 1876.)

Ile Pilau.

Djebel
Nadour.

Two Cones.



Baie de Tunis from northward.

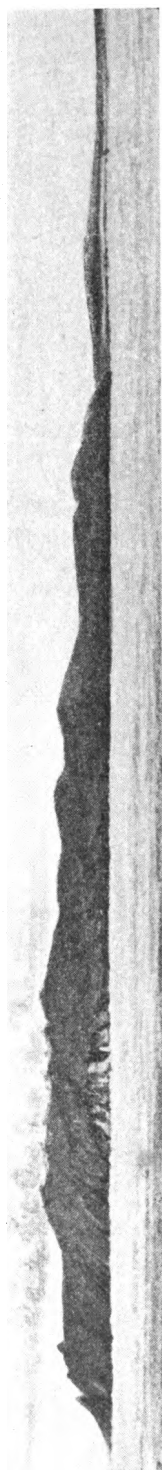
*Cap Carthage,
bearing 212°.*



Zembrella.

*Zembra, bearing 245°,
about 9 miles.*

Zembra from east-north-eastward.



*Cap Bon,
bearing about 180°.*

Cap Bon from northward.
(Originals dated prior to 1913.)

Chart 1381, plan of Cap Farina anchorage.

shoalest are a 15-foot (4^m6) patch about one mile north-eastward, and a 19-foot (5^m8) patch about one mile east-north-eastward of the cape. Djebel Fartas, bearing less than 272° and open northward of Île Pilau, leads 3 cables northward of the northern of these two patches, but not clear of a bank, with depths of from 39 to 56 feet (11^m9 to 17^m1), between 1½ and 3 miles north-eastward of Île Plane, *see* below. A vessel from westward can round Cap Farina in a least depth of 29 feet (8^m8), by keeping the northern extreme of Île Pilau in line with the extremity of Cap Zebib, bearing 296°, until Cap Farina (*Lat.* 37° 11' N., *Long.* 10° 17' E.) is abeam, distant about half a mile, whence she can steer southward.

Île Plane, about 30 feet (9^m1) high, lies about 2 miles eastward of Cap Farina; *see* view facing page 346. Depths of less than 36 feet (11^m0) extend about 2½ cables north-eastward from its north-eastern extremity, 4 cables westward from its western extremity, and 3 cables from its south-eastern extremity.

A light is exhibited, at an elevation of 66 feet (20^m1), from a white, square tower, with a red horizontal band, on a rectangular base, 39 feet (11^m9) in height, situated on Île Plane.

Anchorage.—Small vessels, with local knowledge, can obtain anchorages off the mouth of Oued Namuna, with fairly good holding ground. Landing can be effected either at the mouth of the river, or south-eastward of the point on which is Djebel Fartas.

Anchorage, sheltered from winds from south, through west, to north-east, can be obtained on the southern side of Cap Farina. The depths shoal regularly to the shore, and the holding ground is good.

Chart 250.

GOLFE DE TUNIS.—Golfe de Tunis is entered between Cap Farina and Cap Bon, about 36 miles east-south-eastward, and on the western side of its head is Lac de Tunis. La Goulette and the city of Tunis are on the eastern and western sides, respectively, of the lake. The western shore of the gulf is in most places low, but southward of its head and on its eastern side are ranges of mountains, separated by the fertile Plaine de Soliman.

Djebel Resass, with a serrated crest, rises to an elevation of 2,608 feet (794^m9) about 12½ miles southward of La Goulette, and about 18 miles farther south-westward Djebel Zaghouan (Zaghwan), the highest mountain near this part of the coast, rises to an elevation of 4,232 feet (1,289^m9).

Chart 1381.

Coast.—**Danger.**—From the mouth of Oued Medjerda, the western shore of Golfe de Tunis trends about 15 miles south-south-eastward to Cap Gamart (Kamart); it is low and backed by hills of no great elevation.

Galaat el Andless is a village situated about 2½ miles inland and 6 miles south-westward of the mouth of Oued Medjerda. It stands at the northern end of Koudia Touba (Jebel Kabour el Djeheli), a chain of low hills, and is visible from seaward.

Bled Rauat is a hill, 82 feet (25^m0) high, situated about one mile inland and 7 miles south-south-eastward of Galaat el Andless; on it are a few buildings surrounded by vegetation.

Sidi Amor (Ahmeur) stands at the northern end of a chain of hills

Chart 1381.

about $7\frac{1}{4}$ miles south-south-eastward of Galaat el Andless, and about 4 miles south-south-westward and $6\frac{1}{2}$ miles south-westward, respectively, Djebel Naheli (Nahali) and Djebel Amar (Ahmar) rise to elevations of 928 and 918 feet (282^m7 and 279^m8).

Cap Gamart (Kamart) is a reddish cliff about 65 feet (19^m8) high, and westward of it lies Sebkret er Riana (Sebkha el Ruan), a very shallow lake. Close southward of the cape, the cliffs attain an elevation of about 300 feet (91^m4) and on them stand some ruins. A bank, with depths of less than 18 feet (5^m5), extends about 3 cables east-north-eastward of Cap Gamart (*Lat.* $36^{\circ} 55' N.$, *Long.* $7^{\circ} 59' E.$).
Chart 250.

Baie de Tunis.—Dangers.—Light.—This bay, at the head of Golfe de Tunis, is entered between Cap Gamart and Ras el Fortass about 14 miles east-south-eastward. *See view facing page 347.*

Ras el Fortass, or Cap Zafran, is steep and rocky; on its summit, at an elevation of 330 feet (100^m6), are some ruins. Two rocks lie close north-westward of the cape.

Ras Durdas lies about 2 miles south-westward of Ras el Fortass, and the shore for about 5 miles south-south-westward of it is backed by mountains. There are several thermal springs on this shore, and about 3 miles southward of Ras Durdas is a shrine. A rock, with a depth of $1\frac{1}{4}$ fathoms (2^m3), lies one-quarter of a mile offshore about $1\frac{1}{4}$ miles southward of Ras Durdas.

Djebel Bou Korbeus (Gurbes) rises to an elevation of 1,375 feet (419^m0) about $3\frac{1}{4}$ miles southward of Ras Durdas; it is a barren range and has a rocky summit. At the foot of this range, about $4\frac{1}{2}$ miles southward of Ras Durdas, is the sharp rocky Pointe El Reis.

Banc Sidi el Reis (Gurbes rocks), with depths of less than 6 fathoms (11^m0), on which lie numerous detached rocks, with depths of less than 3 fathoms (5^m5), extends as much as $13\frac{1}{2}$ cables north-westward from the coast about 2 miles south-south-westward of Pointe El Reis. The summit of Djebel Bou Korbeus bearing more than 059° and open northward of Pointe El Reis, and the minaret in the village of Soliman bearing less than 190° and open westward of a coastguard hut about $1\frac{1}{4}$ miles eastward of Marsa Tal Fan, *see page 349*, lead, respectively, northward and westward of these dangers. On the shore, within these dangers, there is a landing place for local small craft.

The village of Soliman, in which there is a tall minaret, is situated on Plaine de Soliman, about $7\frac{1}{2}$ miles south-westward of the summit of Djebel Bou Korbeus, and between it and Marsa Tal Fan lies a lagoon.

Chart 1184.

Cap Carthage lies about 3 miles south-south-eastward of Cap Gamart, *see chart 1381*, and on it is the village of Sidi Bou Saïd. The northern side of the cape is rocky, and close northward of it is the summer resort of La Marsa. The southern side of the cape consists of cliffs alternating with small beaches.

A light is exhibited, at an elevation of 479 feet (146^m0), from a white tower with a black top, 39 feet (11^m9) in height, situated on Cap Carthage.

From Cap Carthage, the shore trends about 4 miles south-south-westward to La Goulette, and is free from off-lying dangers. On its northern part are the ruins of the ancient city of Carthage, a small

Charts 165, 2158a.

Chart 1184.

white fort, Bordj el Djedid (Borj Jedid) and the plateau of El Krodja (Byrsa), surmounted by a church and other buildings; close northward of this last is another plateau, on which is a convent. The southern part of this shore is low and sandy, and on it are numerous buildings. This part, together with another stretch of low sandy beach, which extends from La Goulette to the mouth of Oued Milanie, about 2 miles southward, separates Lac de Tunis from the bay and over it can be seen the white buildings of the city of Tunis, dominated by the citadel. On the foreshore, about one mile southward of La Goulette, are the Harem baths, backed by trees, with the village of Rades, on a hill, about 2 miles southward of them.

Bou Kournine (Bu Kurnin) rises to an elevation of 1,887 feet (575^m2) about 4 miles south-eastward of Rades, and on the shore at its foot is the village of Hammam Lif.

Sidi Jammi (Jmil) is a tall grey building on the dunes near the shore about 4½ miles eastward of Hammam Lif, and the shore between them is low and sandy. Detached shoals, with depths of less than 3 fathoms (5^m5), lie within three-quarters of a mile of the shore in the vicinity of Sidi Jammi, and a shoal bank extends a short distance off a rocky point, named Marsa Tal Fan, about 2½ miles eastward of it.

La Goulette.—Lights.—Buoyage.—The harbour of La Goulette (Lat. 36° 49' N., Long. 10° 18' E.), forming the entrance of the dredged channel leading to the city of Tunis, is entered between two jetties, extending south-eastward, and has a basin on its northern side alongside the quays in which there were, in 1949, depths of 34 feet (10^m4). This basin communicates with another one, northward of it, in which the depths are only 6½ feet (2^m0); on the southern side of the harbour is yet another basin, the western and southern sides of which consist of rubble embankments. A berth is available for large steamers.

The channel leading to the harbour of La Goulette is about 2½ miles in length and 328 feet (100^m0) wide; its dredged depth, in 1950, was 35 feet (10^m7). Southward of the northern jetty the harbour was, in 1946, dredged to a depth of 29 feet (8^m8); elsewhere, as far as the entrance to the dredged channel leading across the Lake of Tunis, the dredged depth was 26 feet (7^m9).

The northern side of the channel is marked by four black, conical light-buoys:—the outer buoy is marked "No. 1" and exhibits a *green occulting* light, showing equal periods of light and darkness; the second buoy is marked "No. 3" and exhibits a *green fixed* light; and the third and fourth buoys are marked, respectively, "No. 5" and "No. 7," and exhibit *green occulting* lights *every four seconds*. These buoys are moored, respectively, about 2½ miles, 2 miles, 1½ miles and 6½ cables east-south-eastward of the head of the northern jetty.

The southern side of the channel is marked by five light-buoys:—the outer buoy is can-shaped, painted red and white in chequers, marked "No. 2" and exhibits a *red group occulting* light, showing two eclipses *every nine seconds*; the second buoy is conical, painted red, marked "No. 4" and exhibits a *red occulting* light *every six seconds*; the third buoy is conical, painted red, marked "No. 6" and exhibits a *red group flashing* light showing two flashes *every nine seconds*; the fourth buoy is conical, painted red, marked "No. 8" and exhibits a *red fixed* light; and the fifth buoy is conical, painted red, marked "No. 10" and exhibits an *occulting red* light *every six seconds*.

Charts 250, 165, 2158a.

Chart 1184.

These buoys are moored, respectively, about $2\frac{1}{2}$ miles, 2 miles, $1\frac{1}{2}$ miles and $6\frac{1}{2}$ cables east-south-eastward, and one cable southward, of the head of the northern jetty.

- 5 A light is exhibited, at an elevation of 41 feet (12^m6), from a white column with a red top, 32 feet (9^m7) in height, situated on the head of the northern jetty at La Goulette.

- A light (*Lat.* $36^\circ 48' N.$, *Long.* $10^\circ 18' E.$) is exhibited, at an elevation of 23 feet (7^m0), from a white column on a black base, 16 feet (4^m9)
10 in height, situated on the head of the southern jetty.

A light is exhibited, on the northern side of the channel, from the head of a spur extending south-south-westward from the northern jetty about 1,000 feet (304^m8) from its head.

- A light, which is only visible from seaward, is exhibited, at an
15 elevation of 40 feet (12^m2), from a white tower with red horizontal bands, 35 feet (10^m7) in height, situated at the head of the harbour.

A light, which is only visible from seaward, is exhibited, at an elevation of 37 feet (11^m4), from a grey beacon, 46 feet (14^m0) in height, situated at the head of the harbour.

- 20 **Anchorage.—Pilotage.—Caution.**—The anchorage off La Goulette is sheltered from winds between south and west, and in winter sometimes becomes dangerous, but the holding ground is very good, and the depths shoal regularly shorewards.

- Submarines are prohibited from diving in the area south-westward
25 of the prolongation of an imaginary line joining Cap Gamart and Cap Carthage, *see* page 11.

- Pilotage, *see* page 20, is compulsory for vessels entering La Goulette or the channel to Tunis; pilots board vessels about half a mile from the outermost light-buoys; to avoid delay or the necessity of anchoring
30 in the roadstead, the signal for a pilot should be made in good time.

Vessels are forbidden to cut into or out of the dredged entrance channel when proceeding from the roadstead to La Goulette, or vice versa; the channel must be followed for its entire length.

- When passing the mineral-loading berths at La Goulette, speed
35 must be reduced to a minimum.

Prohibited anchorage.—Anchorage is prohibited westward of an imaginary line, indicated by a pecked line on the chart, drawn southward from Cap Carthage.

- Canal de Tunis.—Lights.—Buoyage.**—This dredged channel
40 leads across the Lac de Tunis from La Goulette harbour to the basins at the city of Tunis, and is available to vessels drawing up to 22 feet (6^m7). A steam ferry crosses the canal close to La Goulette, and an electric railway runs across the lake on the northern side of the canal. In 1934, H.M. ships *Delhi* and *Despatch*, each 473 feet (144^m2) in
45 length, passed through the canal. In 1948, the normal depth in the canal was 24 feet (7^m3), for a width of 50 yards (45^m7). There is a stopping place or gare to enable vessels to pass one another, near the middle of the canal.

- The sides of the dredged channel are marked by pairs of buoys,
50 of which those on the one hand are painted red and those on the other black.

Lights are exhibited from pairs of beacons, of each pair one being on either side of the channel.

A light (*Lat.* $36^\circ 48' N.$, *Long.* $10^\circ 12' E.$) is exhibited, at an elevation

Charts 250, 165, 2158a.

Chart 1184.

of 49 feet (14^m9), from a grey beacon, 46 feet (14^m0) in height, situated on the prolongation of the axis of the canal, on the western side of the main basin at Tunis.

The speed of vessels in the canal is limited according to the tonnage 5 of the vessel. Vessels with twin screws must be particularly careful to maintain a mid-channel course, to avoid fouling the moorings of the buoys, especially at night. A mid-channel course is maintained, by keeping the light-structure on the western side of the main basin at Tunis exactly mid-way between each pair of the light-beacons 10 marking the sides of the canal.

Before entering the canal, vessels must be sure to ascertain that it is clear. On approaching the steam-ferry, vessels should sound a blast on their siren or whistle.

The tidal streams in the canal do not exceed one knot. 15

Signals.—There is a signal station with a flagstaff at the Pilots' office, near the root of the northern jetty at La Goulette, at which the following signals are shown :—

By day, two red rectangular flags, disposed vertically, or at night, two *red* lights, similarly disposed, denoting "Entry into the canal 20 is prohibited."

The following signals are to be shown by vessels in the canal, as necessary :—

By day, flag B of the International Code of Signals, or at night, a *red* light between two *white* lights, disposed vertically, denoting 25 "I am aground."

By day, flag B of the International Code of Signals, above the code pendant, or at night, a *red* light above a *white* light, denoting "I am secured at the stopping place or made fast."

The following signals are shown by the dredgers, either in the 30 canal or in the basins :—

By day, flag H of the International Code of Signals, or at night, a *white* light over a *red* light, denoting "Vessels may pass ; proceed as slowly as possible."

By day, flag W of the International Code of Signals, or at night, 35 one *red* light, denoting "The channel is obstructed."

Tunis.—Port facilities.—Communications.—This city, which, in 1948, had a population of about 200,000, is the capital of Tunisia and the seat of the French administration and military protectorates. A British Consular officer resides here. 40

The harbour (*Lat.* 36° 48' N., *Long.* 10° 12' E.) consists of a rectangular basin, about 1,300 feet (396^m2) long, and 1,000 feet (304^m8) wide, dredged to a depth of 24 feet (7^m3), in 1948. The northern, southern and western sides of this basin are quayed and vessels drawing up to 17 feet (5^m2) can secure alongside. There is a warping buoy in the 45 basin.

On the southern side of the above basin, there is another, dredged, in 1948, to a depth of 21 feet (6^m4), which is reserved for shipping minerals.

On the northern side of the main basin, there is yet another 50 basin, dredged to a depth of 14½ feet (4^m4), with piers on its western side.

Fresh provisions are usually plentiful at Tunis, but notice should be given if large quantities are required. Water can be obtained from

Chart 1184.

hydrants, either at La Goulette or at Tunis, but during the summer months the supply is limited. For deratisation, *see* page 22.

There are several hospitals.

- 5 Repairs can be effected either at La Goulette or at Tunis, and tugs are available. For particulars of the dry dock at La Goulette, *see* page 486.

There are several cranes, some of which are floating, and are capable of lifting weights up to 5 tons.

Stocks of coal, fuel oil, and diesel oil are maintained.

- 10 Regular steamer communication is maintained with England, and with ports in the Mediterranean. There is regular communication by air between Tunis and Marseille, via Ajaccio, in Corsica, and between Tunis and Rome, via Cagliari or Palermo.

For radio communication, *see* page 21.

- 15 **Climatic table.**—*See* page 57.

Chart 250.

- Coast.—Dangers.**—From Ras el Fortass the eastern shore of Golfe de Tunis trends about 24 miles north-eastward to Cap Bon, and on it are a number of coastguard huts. This stretch of coast is backed
20 by a range of mountains named Abd er Rahmane (Abd-el-Rhaman), the principal summits of which are Djebel Ben Oulid (Ulud), 1,552 feet (473^m0) high, with cliffs near its summit, and Djebel Bou Krim (Bu Krib), a prominent cone 778 feet (237^m1) high, situated, respectively, about 8 miles eastward and 15½ miles east-north-eastward of Ras el
25 Fortass. For the first 3½ miles the coast is cliffy, but thence a sandy beach extends about 6 miles to Ras Degbi Marsa. Near the south-western end of the beach is a coastguard hut (*Lat.* 36° 52' N., *Long.* 10° 42' E.), with Sidi Mararghni close south-eastward of it.

- Between Ras Degbi Mersa and Baie d'Oumceten, about 7 miles
30 north-eastward, the coast consists of small rocky points separating sandy beaches. Sidi Daoud (Daud) surmounts a point about half a mile south-westward of the south-western entrance point of Baie d'Oumceten. This bay is shallow and encumbered with rocks; on its northern shore is a fishing settlement, with two tall chimneys,
35 situated on an islet connected with the mainland by a viaduct. Tunny nets, *see* page 27, are laid out annually in the vicinity of Baie d'Oumceten.

- Ras el Ahmara (Amar), about 3 miles northward of Sidi Daoud, is low and rocky, and about 1½ miles southward of it Djebel el Hamam
40 (Hammam) rises to an elevation of 302 feet (95^m1); this hill is conical and from certain directions appears as an islet. Between Ras el Ahmara and Cap Bon, the coast is rocky and somewhat indented. A reef, awash in places, extends from the coast eastward of Ras el Ahmara, to a position about one mile north-eastward of it.

- 45 **Off-lying islets.—Light.**—Zembra, *see* view facing page 347, lies about 6 miles north-westward of Ras el Ahmara; it is 1,421 feet (433^m1) high, and on its north-western side are three peaks with rugged cliffs on their north-western sides; the south-eastern slopes are more gentle, and are covered with vegetation. On the southern side of the
50 islet is a small beach, near some wooden huts. A rock, named Lantorcho, lies about 4 cables westward of the northern extremity, and another rock lies close off the south-western extremity of the island.

Zembretta, about 3½ miles north-north-westward of Ras el Ahmara,

Charts 165, 2158a.

Chart 250.

is 161 feet (49^m1) high, small and flat-topped. Depths of less than 6 fathoms (11^m0) extend a short distance from it. The channel between Zembra and Zembretta is clear of dangers.

A light is exhibited, at an elevation of 180 feet (54^m9), from a white tower with a black lantern, 26 feet (7^m9) in height, situated on Zembretta (*Lat.* 37° 06' N., *Long.* 10° 53' E.).

Anchorage.—Temporary anchorage can be obtained, in depths of from 11 to 14 fathoms (20^m1 to 25^m6), about 2½ cables northward of the south-eastern extremity of Zembra, but it is very precarious and is only sheltered from westerly winds. Landing can be effected amongst the rocks on the western side of the bay on the southern side of the islet.

Chart 250, plan of Cape Bon.

Small craft, with local knowledge, can obtain shelter in a cove near El Haouaria (El Awaria), which village lies about 2½ miles south-eastward of Cap Bon and is visible from seaward. Tunny nets, *see* page 27, are laid out annually in this cove.

Small vessels can obtain temporary anchorage, in a depth of 11 fathoms (20^m1), in the bay on the western side of Cap Bon; the bottom is rocky, but the bay is sheltered from the east-south-easterly winds.

COAST.—Dangers.—Light.—Cap Bon, *see* views facing pages 343 and 366, is the north-eastern extremity of Tunisia, and of the mountainous promontory separating Golfe de Tunis from Golfe d'Hammamet, *see* chart 250. A shoal, with a depth of one fathom (1^m8), lies close off the cape.

A light is exhibited, at an elevation of 412 feet (125^m6), from a white tower with a black horizontal band, surmounting a dwelling, 66 feet (20^m1) in height, situated about half a mile south-eastward of Cap Bon. A signal station stands on the summit of the hill dominating the cape, through which reports can be transmitted through Lloyds.

Ras ed Drek (Idda) is the southernmost of three points, which lie close together about 3½ miles south-eastward of Cap Bon; the coast between is high and inaccessible. Rocks and shoals extend from 1½ to 3½ cables from the three points. The ruins of a fort surmount a ridge immediately above Ras ed Drek.

Off-lying bank.—A bank, with depths of less than 50 fathoms (91^m4) and about 5 miles in extent, lies about 1½ miles eastward of Cap Bon. In 1948, a depth of 37 fathoms (67^m7) was obtained over the northern end of this bank.

Anchorage.—Anchorage can be obtained in a bay on the southern side of Ras ed Drek; it is well sheltered from north-westerly winds, but the holding ground is poor, as the bottom consists of hard sand strewn with rocks.

Coast.—Dangers.—Lights.—From Ras ed Drek, the coast trends about 10 miles south-south-eastward to Ras el Melah (Mirh) and consists of beaches alternating with cliffs. It is backed by a chain of hills which join three summits near El Haouaria (Awaria) to the reddish Djebel Ouazdra (Husdra), about 2½ miles north-westward of Ras el Melah and 453 feet (138^m1) high.

Sidi Mohamed Ech Cherif (Eshereef) is a large shrine, surrounded

Charts 165, 2158a and b.

Chart 250, plan of Cape Bon.

by trees, standing on a hill about 5 miles southward of Cap Bon. About 2 miles northward of Djebel Ouazdra there is a red peak.

Chart 250, plan of Kelibia road.

- 5 Ras el Melah (Mirh) is low, but it rises to a large whitish sandhill at the junction of two lines of coastal dunes. This point is fringed by a shoal bank extending about half a mile offshore. An obstruction, with a depth of $8\frac{1}{2}$ fathoms (15^m5), lies about $1\frac{1}{2}$ miles north-north-eastward of Ras el Melah.
- 10 From Ras el Melah the coast trends about $2\frac{1}{2}$ miles south-south-westward to Ras Mostefa (Mustapha). Ras Mostefa is dominated by a hill on which stands a large fortress, *see* view on chart 250. Ras Mostefa consists of two sharp points, on the western of which stand the ruins of a battery and a shrine; between these two points are the
- 15 sunken remains of an ancient mole. There is a custom house in Ras Mostefa (*Lat.* $36^{\circ} 50' N.$, *Long.* $11^{\circ} 07' E.$).

A light is exhibited, at an elevation of 269 feet (82^m0), from a masonry structure with a black lantern, 59 feet (18^m0) in height, situated on the eastern bastion of the fortress above Ras Mostefa.

- 20 Anse de Kelibia, a short distance within the head of which is the small town of Kelibia, lies south-westward of Ras Mostefa. At the head of the bay is a beach, and on its eastern side are some rocks, awash, close inshore; some rocks lie close off the old custom house, on the shore southward of the town. The town, with a population
- 25 of about 7,000, in 1948, offers few resources.

A jetty extends about one cable south-westward from Ras Mostefa. For about 400 feet (121^m9) of its length, vessels, drawing up to 11 feet (3^m4), can lie alongside. A light is exhibited, at an elevation of 24 feet (7^m3), from a white tower, the upper part of which is painted black,

- 30 situated on the head of the jetty.

Anchorage.—Anse de Kelibia affords anchorage, but it is sheltered only from winds from west through north to north-east. The bottom is of sand, and the holding ground is mediocre. Anchorage can be obtained with the summit of Djebel Ouazdra in line with a shrine close

35 eastward of the town. With north-easterly or east-north-easterly winds, better shelter is obtained farther northward, with the southern bastion of the fortress above Ras Mostefa bearing 045° , and Sidi Saïd, about half a mile west-north-westward of the old custom house, bearing 290° .

Chart 250

Coast.—From the western end of Anse de Kelibia, a sandy beach off which there are no dangers extends about 27 miles south-south-westward to Ras Maamoura (Mahmur). This beach is backed by a plain extending to the foothills of the Abd er Rahmane range.

- 45 Numerous villages, shrines and ancient ruins are situated on this stretch of coast and many of them are visible from seaward. The most important are Sidi Aati and Sidi Hassène, about 4 miles westward of Ras Mostefa; the village of Menzel Temine, with Sidi Ahmed Ben Selmane (Assen) and Sidi Salem (Sellim) close eastward of it, situated
- 50 about 7 miles south-westward of Ras Mostefa; the village of Menzer Heurr (Menzelheur), with Sidi Ali Moujehed (Othman el Hadits) south-south-eastward of it, situated about 4 miles south-south-westward of Menzel Temine; the villages of Korba (Kurba) and Tazerka (Tazarka), situated, respectively, about $10\frac{1}{2}$ and $12\frac{1}{2}$ miles

Charts 165, 2158a and b.

Chart 250.

south-south-westward of Menzel Heurr; and the village of Soma, situated about $2\frac{1}{2}$ miles westward of Tazerka on the slope of Djebel Oued en Nemer (Soma), *see* below.

El Maamoura (Mahmur) is a village situated on Ras Maamoura and about $1\frac{1}{2}$ miles northward of it is the prominent Sidi Djabroun (Jabrur), standing, at an elevation of 131 feet (39^m9), on the shoulder of the south-easternmost foothill of the mountains.

Ras Maamoura (*Lat.* $36^{\circ} 27' N.$, *Long.* $10^{\circ} 49' E.$) is low and, in addition to the village, Sidi Ahmed ben Daoud (Ben Daud) stands on it.

Off-lying banks.—Banc de Kourba (Kurba), with depths of from 15 to 20 fathoms (27^m4 to 36^m6), lies about 10 miles offshore 12 miles east-north-eastward of Ras Maamoura.

Banc de Nabeul (Nebœl), with depths of less than 20 fathoms (36^m6), extends about 7 miles southward of Ras Maamoura.

Banc Maamoura (Mahmur), with depths of from 13 to 20 fathoms (25^m8 to 36^m6), lies about 9 miles south-south-eastward of Ras Maamoura.

These banks should be avoided in bad weather, especially during north-easterly gales.

Golfe de Hammamet.—Dangers.—This gulf is entered between Ras Maamoura and Presqu'île de Monastir, about 40 miles southward. Its shores are sandy, and on them, near the northern and southern ends, respectively, are the towns of Hammamet and Sousse (Susa).

Djebel Oued en Nemer (Soma) rises to an elevation of 545 feet (166^m1), about 6 miles westward of Ras Maamoura. From it a chain of hills extends about 9 miles south-westward of Djebel Bou Rukba, 1,739 feet (530^m0) high. At the feet of these hills lie the villages of Beni Khiair (Khere) and Dar Chabane (Deir Shaaban), and the small town of Nabeul (Nabœl).

The town of Hammamet, *see* page 356, lies about 10 miles south-south-westward of Ras Maamoura, and between it and Hergla (Herkla), about $22\frac{1}{2}$ miles southward of it, the beach is backed by hills increasing in elevation towards the interior.

The principal landmarks on this stretch of coast are:—Bordj el Assa el Jeriba (Baba Sellum), situated on the shore about 6 miles northward of Hergla; and Fort de Takrouna (Takrun), which stands on an isolated hill, 656 feet (199^m9) high, about 7 miles westward of Bordj el Assa el Jeriba.

Hergla is a village, backed by a hill about 100 feet (30^m5) high, in which are a minaret and a shrine, both of which are good marks. In the vicinity of the village, the shore is rocky, but farther southward it again becomes sandy. Numerous rocks awash lie close inshore in the vicinity of Hergla (*Lat.* $36^{\circ} 02' N.$, *Long.* $10^{\circ} 31' E.$).

From Hergla, the shore trends south-south-eastward, for about 9 miles, to Ras Marsa, and is backed by dunes.

Chart 1159.

Ras Marsa, close southward of which is a coastguard hut, is fringed by rocks, with depths of less than 3 fathoms (5^m5), extending about half a mile offshore. The tall minaret in Sousse, in line with a smaller one near the shore southward of it, leads eastward of these rocks. The point is backed by dunes, on one of which stands Sidi el Kann-taoui (Kantawee).

Charts 165, 2158a.

Chart 1159.

Les Sorelles, *see* chart 250, form a plateau, close inland of Ras Marsa, with three peaks, resembling detached, equidistant redoubts.

Oued el Hammam flows into the gulf about $1\frac{1}{4}$ miles southward of 5 Ras Marsa; close southward of it and about one mile inland the white buildings of the village of Hammam Sousse (Susa) show up from amongst the surrounding vegetation; on the coast eastward of this village are some buildings, most of which are in ruins, except one, named Villa Gandolphe.

10 Sousse (Susa), *see* page 357, lies about $4\frac{1}{2}$ miles south-south-eastward of Ras Marsa, and southward of it the beach is backed by extensive undulating plains covered with vegetation.

Sidi Abd-el-Hamid stands on the shore about 2 miles south-eastward of Sousse, and on a hill about 3 miles south-south-eastward of it is Sidi en 15 Najar. The beach abreast Sidi Abd-el-Hamid, and for some distance south-eastward of it, is fringed by a shoal bank extending as much as $1\frac{1}{4}$ miles offshore in places; large vessels should not approach within 2 miles of it. A large wood near the shore marks the south-eastern end of the beach.

20 Lagune de Sahline (Sebkha Ain Sahalin) lies between Presqu'île de Monastir and the mainland. It has a shallow entrance about 7 miles east-south-eastward of Sousse; the shore between is backed by dunes.

The ancient port of Ruspina lies about one mile east-north-eastward of the entrance to Lagune de Sahline, and the shore in its vicinity 25 is fronted by shoals, with depths of less than 3 fathoms (5^m5), extending about half a mile offshore.

Chart 250, plan of the Bay of Hammamet.

Hammamet.—Light.—This fortified town (*Lat.* $36^{\circ} 23' N.$, *Long.* $10^{\circ} 37' E.$), *see* view on chart 250, is built on a low, sandy promontory 30 and is backed by numerous buildings and cultivated land.

A light is exhibited, at an elevation of 52 feet (15^m8), from a metal column on a tower, 52 feet (15^m8) in height, situated at the western angle of the fortifications of Hammamet.

In 1950 a single tree was situated about $1\frac{1}{4}$ miles north-north- 35 eastward and another $1\frac{1}{2}$ miles north-eastward of Hammamet lighthouse. A tower stands about 5 miles west-south-westward of the lighthouse (chart 250).

A small detached 3-fathom (5^m5) patch lies 4 cables offshore about $1\frac{1}{4}$ miles westward of the lighthouse.

40 A small detached rocky patch, with a depth of $5\frac{1}{2}$ fathoms (10^m1), lies three-quarters of a mile offshore about 3 miles south-westward of the lighthouse.

Anchorage.—Caution.—Anchorage, sheltered from northerly and north-westerly winds, can be obtained off Hammamet, but the holding 45 ground is mediocre, and at times heavy north-westerly squalls descend from the mountains. Small vessels can obtain shelter from north-easterly and easterly winds by anchoring close inshore. Large vessels can obtain anchorage, in depths of about 8 fathoms (14^m6), but a coastguard hut on the beach about 2 miles east-north-eastward of the 50 town should be kept open southward of the southern side of the fortifications of the latter, bearing less than 069° .

Anchorage is prohibited, on account of submarine cables, northward of the parallel of $36^{\circ} 24'$ north latitude and between the meridians of $10^{\circ} 45'$ and $10^{\circ} 48'$ east longitude. *See* page 19.

Charts 165, 2158a.

Chart 250, plan of the Bay of Hammamet.

Landing can be effected on the beach under the western walls of the town.

Chart 1159, plan of Susa.

Sousse.—Lights.—Beacons.—The town of Sousse (Susa), with its white battlemented walls, the church belfry and the high tower of its cathedral, is easy to identify. In it there is a tall minaret, and close northward of it are the ruins of a battery. In 1948, it had a population of about 30,000. A British Consular officer resides here.

A light is exhibited, at an elevation of 230 feet (70^m1), from a white, square tower, 72 feet (21^m9) in height, situated in the citadel at Sousse.

The harbour is protected by two moles; the entrance, between the heads of the moles, is 230 feet (70^m1) wide. A jetty extends about 2 cables east-south-eastward from near the root of the northern mole and protects the entrance from northerly swell. In 1948, there were depths of 24 feet (7^m3) in the entrance, and of 21 feet (6^m4) over a large part of the harbour. In 1949, works were in progress to dredge the entrance and part of the harbour to a depth of 28 feet (8^m5). In 1949, there were depths of 21 feet (6^m4) alongside the quays for a total length of 2½ cables.

A light is exhibited, at an elevation of 30 feet (9^m1), from a red, metal, framework structure, 19 feet (5^m8) in height, situated on the head of the jetty at Sousse (*Lat. 35° 50' N., Long. 10° 39' E.*).

A light is exhibited, at an elevation of 21 feet (6^m4), from a red tower, 16 feet (4^m9) in height, situated on the northern side of the harbour entrance.

A conical buoy is moored in the south-western part of the harbour, and a can buoy in the north-western part. There are two mooring buoys.

Anchorage.—The roadstead off Sousse is not safe, and the holding ground is bad. It is exposed to winds from north to south-east, but the waves are deadened by the seaweed, so that in summer the anchorage may be considered fairly good. A vessel should anchor with Sidi en Najar bearing more than 159°, and open eastward of Sidi Abd-el-Hamid, and the citadel bearing less than 255°. A good berth is, in a depth of 6½ fathoms (11^m9), about 7½ cables from the head of the jetty, with light-structure on the jetty bearing 282°, the tower of the citadel bearing 265° and Sidi en Najar bearing 166°.

Port facilities.—Signals.—The signal for a pilot, in addition to the usual signals, is *three long* blasts on the whistle or siren; see page 20. Signals regulating entry and exit to the port are shown; see page 14.

Storm signals are shown, see page 12, but only when the wind is expected to exceed force 5 of the Beaufort scale.

There is a hospital.

Fresh provisions can be procured. Water is laid on to the quays. A small stock of coal is maintained. A tug is available. There is one 40-ton crane and several smaller ones.

For deratisation, see page 22.

Regulations.—Port regulations are in force. Vessels should obtain copies on arrival.

Chart 1159, plan of Monastir.

Monastir.—Lights.—The northern side of Presqu'île de Monastir is faced with rugged cliffs on the top of which, at the western end, is a large white house, in ruins, surrounded by trees, and at the eastern

Chart 1159, plan of Monastir.

end is a large shrine ; the eastern side of the peninsula slopes gently to the sea.

Île Sidi el Rhedamsi (Egdemsi), 45 feet (13^m7) high, lies 2 cables 5 offshore northward of the shrine mentioned above, and on it are the buildings of a tunny fishery, and another shrine. Tunny nets, *see* page 27, are laid out annually, north-north-eastward of the island.

Ksira te Achmam and Ksira Lostania are two islets, situated, respectively, close northward and south-eastward of Île Sidi el Rhedamsi, 10 and all three lie on a shoal spit extending from the north-eastern extremity of the peninsula.

The town of Monastir (*Lat.* 35° 46' N., *Long.* 10° 50' E.), which, in 1948, had a population of about 10,000, is situated at the north-eastern end of the peninsula ; it is surrounded by battlemented walls, flanked 15 by towers, and is not easily identified from northward. At the northern end of the eastern walls is a citadel in which is a large tower, and at the foot of these walls is a beach at the head of a small bay. Coasting steamers call regularly.

South-eastward of the above-mentioned beach there is a short 20 stretch of rocky and indented coast on which are a small fort and a large house, with several buildings between them.

Bordj el Kelb, about half a mile southward of the above-mentioned large house, stands at the northern end of an extensive beach of mud and sand ; about 3½ cables south-westward of it is a custom house 25 and pier, near some salt pans, and between them is a factory with two chimneys.

About 4 cables south-westward and 6½ cables south-south-westward, respectively, of the custom house pier are a conspicuous yellow house and a pier with a depth of 7 feet (2^m1) at its head.

30 A light is exhibited, at an elevation of 30 feet (9^m1), from a shrine with black bands on its eastern and southern faces, 20 feet (6^m1) in height, situated on Bordj el Kelb.

A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column, 13 feet (4^m0) in height, situated on the roof of the custom 35 house pier. In 1947, this light was extinguished.

Anchorage.—There are several places where anchorage can be obtained in the vicinity of Monastir. The best berth, sheltered from north-westerly, easterly, and south-easterly winds, is off the custom house, with the latter bearing between 270° and 282° ; the holding 40 ground is fairly good, and landing can be effected at the pier, which has a depth of 4 feet (1^m2) at its head.

Anchorage can also be obtained on the western side of Île Sidi el Rhedamsi, in the bay formed by that islet and the coast ; the holding ground is not very good, but the anchorage is sheltered from easterly 45 and east-north-easterly winds.

The anchorage in the small bay on the eastern side of the town, between Ksira Lostania and Ksira Maksura, about 3 cables south-south-eastward of it, is bad, for the bottom is rocky and is exposed to onshore winds ; it should only be used temporarily and with 50 westerly winds.

Chart 1159.

Baie de Monastir.—Dangers.—This bay is entered between Presqu'île de Monastir and the shallow spit extending from a point on the coast, about 9½ miles south-eastward of Bordj el Kelb, to Île

Chart 1159.

Kuriate, *see* page 360, and affords the best refuge on the eastern coast of Tunisia between Cap Bon and Ras Kaboudia (Kapudia), *see* page 362. Though open to northerly and north-easterly winds, the masses of seaweed which fringe the shores and surround the islands deaden the sea and render anchorage in depths less than $5\frac{1}{2}$ fathoms (10^m) absolutely secure; the measure of safety is increased the further it is possible to penetrate into the bay. The head of the bay, however, is very shallow, depths of less than 5 fathoms (9^m), mud and sand, extending about 3 miles from it. In its south-western part, off Ksiba el Mediouni (Xiebah) and Lamta (Lampta), depths of less than 6 feet (1^m) extend about one mile offshore.

From the Custom house pier near Monastir, a low marshy shore trends southward towards the head of the bay, and $1\frac{1}{2}$ miles southward of the pier, and about half a mile offshore, is a low islet, covered with vegetation.

Sidi Zarhouani (Zaghuani) lies at the head of a small bay, about $2\frac{3}{4}$ miles southward of the custom house, and at a short distance southward of it is the minaret of Krnis (Neis), surrounded by trees. South-eastward of Krnis, the shore is backed by hills.

Sidi Messaoud (Messaoud) stands, at an elevation of 225 feet (68^m), about one mile southward of Krnis, and close to the coast about the same distance farther south-eastward is the village of Ksiba el Mediouni (*Lat.* $35^\circ 41' N.$, *Long.* $10^\circ 51' E.$), in which there are a minaret and a shrine.

Lamta (Lampta), about 2 miles south-eastward of Ksiba el Mediouni, has two shrines in it and close north-westward and south-eastward of it lie, respectively, some ruins and the white buildings of the village of Saïada.

Enshir el Bey, close to the shore about 3 miles south-eastward of Saïada, has a large white building on it, and about 2 miles east-south-eastward of it stands Sidi Fadeline (Sidi Fatlin), on a hill about 100 feet (30^m) high, with an isolated palm tree on one side of it. Between Enshir el Bey and Sidi Fadeline stands the village of Teboulba (Tebulba).

Tunny nets, *see* page 27, are laid out annually in the vicinity of Monastir.

Anchorage.—Buoys.—Large vessels can obtain anchorage in Baie de Monastir, in a depth of about $7\frac{1}{2}$ fathoms (13^m), with the light-house on Île Kuriate, *see* below, bearing 054° , and the tower of the citadel at Monastir bearing 286° ; with westerly winds, however, the anchorage off the custom house at Monastir is to be preferred.

A small vessel can obtain sheltered anchorage as convenient on either side of the bay, according to the direction of the wind, or in the deep mentioned below.

At the head of Monastir bay, off the shore between Saïada and Teboulba, is a deep, with from $3\frac{1}{2}$ to $3\frac{3}{4}$ fathoms (5^m to 6^m) in it; this deep is separated from the main part of the bay by shoals, with depths of from $1\frac{1}{2}$ to 2 fathoms (2^m to 3^m), through which is a buoyed channel available to vessels with local knowledge, drawing up to 14 feet (4^m). The anchorage in the deep is secure in all winds, and the entrance channel is approached with the minaret in Teboulba bearing 155° .

Off-lying islands.—Dangers.—Light.—Buoyed channel.—Two

Charts 250, 165, 2158a and b.

Chart 1159.

islands lie near the extremity of the shallow spit forming the eastern side of Baie de Monastir. The inner part of this spit is covered by the red sector of the light on Île Kuriate, between the bearings 348° and 053° .

Île Kuriate, the larger of the two, is situated about 9 miles east-north-eastward of Monastir; it is low, except in its centre, where there is a hillock about 25 feet (7^m6) high. On the western side of the island is a small breakwater sheltering a wooden landing pier.

- 10 A light is exhibited, at an elevation of 98 feet (29^m9), from a white square tower surmounting a rectangular dwelling, 85 feet (25^m9) in height, situated on the summit of Île Kuriate.

- Île Conigliera (*Lat. $35^{\circ} 46' N.$, Long. $11^{\circ} 01' E.$*), about $1\frac{1}{2}$ miles south-south-westward of Île Kuriate, is 20 feet (6^m1) high, and on it
15 are some clumps of vegetation, a square house and the buildings of a fishery.

Tunny nets, *see* page 27, are laid out annually, north-north-westward of Île Kuriate and north-westward of Île Conigliera.

- A bank, with depths of less than 6 fathoms (11^m0), extends about
20 $2\frac{1}{2}$ miles east-north-eastward from Île Kuriate, and there are depths of less than 10 fathoms (18^m3) within $6\frac{1}{2}$ miles of it in that direction. In bad weather very heavy seas are encountered on this bank.

- A bank with a depth of 13 fathoms (23^m8), the existence of which is doubtful, was reported by H.M.S. *Adventure*, 1823, to lie about
25 11 miles eastward of Île Kuriate.

The inner part of the spit on which these islands lie is awash within 4 miles of the coast.

- A narrow, tortuous channel, with a depth of 13 feet (4^m0), leads across the spit about $1\frac{1}{4}$ miles south-westward of Île Conigliera, but
30 there are depths of 10 feet (3^m0) about half a cable eastward and south-eastward of its eastern end. It is marked by two black, conical buoys, each with a white horizontal band and surmounted by two cones, points up, on its northern side; and by two red can buoys, each with a white horizontal band and surmounted by two cones,
35 points down, on its southern side. A vessel approaching from westward should keep the lighthouse on Île Kuriate well open northward of Île Conigliera until the eastern pair of buoys is in line with the western pair, bearing about 103° . A vessel approaching from eastward should keep the whole town of Monastir open northward of the
40 conical buoys.

- Anchorage.**—Anchorage can be obtained on the eastern side of the spit; it is completely sheltered from north-westerly and northerly winds, and partially so, on account of the effect of the seaweed, from winds from north-north-eastward. In bad weather, vessels from
45 southward are advised to take advantage of this anchorage to avoid the heavy seas on the bank east-north-eastward of Île Kuriate. Good holding ground is assured by keeping the lighthouse on Île Kuriate bearing 348° , and vessels should anchor as close to the island as their draught permits.

- 50 **Coast.—Dangers.**—Ras Dimasse (Dimas), about 3 miles east-south-eastward of Sidi Fadeline, is low and not easy to identify. It is fringed by a shoal bank extending about one mile offshore, and close northward of it, on the edge of the shallow spit extending to Île Kuriate, lies Île de Thapsus, between which island and the coast is

Chart 1159.

a shallow lagoon. From Ras Dimasse, a sandy beach, backed by hills, extends about 7 miles southward to Cap Afrique (Africa).

Sidi Bessari (Bizari) surmounts a hill, 164 feet (50^m0) high, about 1½ miles southward of Ras Dimasse. In 1942, there was a conspicuous double-topped palm tree about 2 miles south-south-westward of Sidi Bessari. 5

Anchorage.—Anchorage, somewhat sheltered from northerly winds, can be obtained off the coast southward of Ras Dimasse.

Chart 1159, plan of Mahedia.

10

Mahdia.—**Dangers.**—**Lights.**—**Buoys.**—Sidi Messaoud lies about 2½ miles west-north-westward of Cap Afrique. It has a minaret which is obscured by trees on certain bearings.

Cap Afrique (Africa) is the extremity of a small peninsula fringed with rocks and shoals extending about 4 cables east-north-eastward of it. There are depths of less than 6 fathoms (11^m6) within 6 cables of the coast northward of the peninsula, and a small, detached, 4½-fathom (8^m7) patch lies about one cable off the middle of its south-eastern side. 15

A conical buoy, painted red and white in horizontal bands and surmounted by two cones, bases together, is moored about 8 cables east-north-eastward of the light-tower near Sidi Jabeur, *see* below. Vessels should pass south-eastward of this buoy. 20

Mahdia (Mahedia), which had a population of about 12,000, in 1948, is situated on the peninsula of Cap Afrique, and its white buildings, dominated by a citadel, show up well from seawards. On a hillock, near the extremity of the peninsula, stands Sidi Jabeur (Jaber), and on the isthmus, in the western part of the town (*Lat.* 35° 30' N., *Long.* 11° 05' E.), is a small fort with a large, square, battlemented tower. Coasting steamers call regularly. There is a hospital. 25 30

A light is exhibited, at an elevation of 123 feet (37^m6), from a black metal tower surmounting a white dwelling, 41 feet (12^m5) in height, situated close north-eastward of Sidi Jabeur.

A small harbour, protected by breakwaters and available for small craft only, is situated on the southern side of the isthmus. The entrance is about 200 feet wide and there are depths of 5 feet (1^m5) alongside the quay.

A light is exhibited, at an elevation of 24 feet (7^m3), from a red, iron column, 14 feet (4^m3) in height, situated on the head of the north-eastern breakwater. In 1947, this light was extinguished.

From the harbour, a sandy beach extends south-south-westward. A factory, with a conspicuous chimney, lies about half a mile south-westward; and a small rocky cliff, surmounted by Sidi Ben Rayada (Gheïada), lies about 1½ miles south-south-westward of the head of the south-western breakwater. This beach is fronted by a bank, which, with depths of less than 3 fathoms (5^m5), extends as much as 8 cables offshore, and is marked, on its north-eastern side, by a red buoy. 45

There is a small deep, with depths of 2 fathoms (3^m7), close inshore, off the Jewish and European cemeteries, about half a mile south-westward of the harbour. The approach to the deep is buoyed, but access is difficult on account of shoals in the channel with depths of from one to 1½ fathoms (1^m8 to 2^m7). 50

Charts 250, 249, 165, 2158a and b.

Chart 1159, plan of Mahedia.

Anchorage.—Vessels can obtain anchorage either northward or southward of Mahdia, but that southward of the town is the more frequented. The deep mentioned above should not be used with winds
5 between north and east.

Vessels anchoring northward of the town should do so with the small fort in the western part of the town in line with the towers in the western wall of the town. The bottom is rocky, and the holding ground is bad. Landing is difficult on account of the rocks fringing
10 the northern side of the peninsula.

Vessels anchoring southward of the town obtain no better holding ground, but complete shelter is afforded against winds from north and north-east. Vessels should not anchor westward of the alignment of Sidi Jabeur and the ruins of a portico at the entrance of the
15 ancient port southward of it, bearing 011° . Landing on the southern side of the peninsula is not easy.

Chart 1159.

Coast.—Rejiche (Rejish), a village on the seaward slopes of the hills about $2\frac{1}{2}$ miles southward of Mahdia, and its white houses are
20 prominent; between it and the coast lies Sidi Bel Kassem.

Ras Salakta lies about $4\frac{1}{2}$ miles southward of Sidi Bel Kassem, and on its southern side are the remains of an ancient mole; in its vicinity the hills, which attain an elevation of 328 feet (100^m), approach the coast, and the beach gives way to vertical rocky cliffs, ending at the
25 headland, which latter is fringed with rocks for a short distance offshore.

Ksour Essaf (Ksursef) is a small town (*Lat.* $35^{\circ} 25' N.$, *Long.* $11^{\circ} 00' E.$) on the hills above Ras Salakta. It is situated about 3 miles inland and is visible from seaward.

Chart 249.

30 From Ras Salakta the coast trends about 11 miles south-south-eastward to Ras Kaboudia (Kapudia), and consists of sandstone hillocks covered with sand; rocks alternate with sandy beaches and toward the southern end the coast is backed by extensive dunes.

Sidi Abdallah el Merakchi stands on the coast about 2 miles north-
35 westward of Ras Kaboudia, and about one mile south-westward of it is the village of Chebba (Sheba), in which are two shrines.

Tour Kredidja (Khadija), large, square and 92 feet (20^m) in height, stands on the north-eastern extremity of Ras Kaboudia.

Ras Kaboudia (Kapudia) is the extremity of a rocky plateau terminating in a small peninsula fringed with islets. On the peninsula
40 are the buildings of a tunny fishery, with a tall chimney.

Tunny nets are laid out annually northward of Ras Kaboudia; see page 27.

Anchorage.—Anchorage, sheltered from north-westerly and
45 northerly winds, can be obtained off the southern side of Ras Salakta. *Charts 249 and 1162.*

Bancs Kerkennah.—Beacons.—Buoys.—These banks, formed of sand, mud and weed, extend about 35 miles seaward from the coast between Ras Kaboudia and Ras Burmada, about 52 miles
50 south-westward. They are separated from the mainland by Canal des Kerkennah, and on their north-western part lie Îles Kerkennah and several islets. The shallower parts of these banks are intersected by numerous steep-sided channels, some of which are comparatively deep, and the seaward edges of these banks are fringed by shoal bank.

Charts 165, 2158a and b.

Charts 249 and 1162.

Îles Kerkennah are low and not easy to distinguish from seaward. Île Chergui (Sherki), the larger and north-eastern island, is divided, at spring tides, by shallow lagoons into three parts. The north-eastern part is barren and uninhabited; on the middle part are the villages of El Khéraib (Kraib), Djouaber (Juabœr), Ech Chergui (Sherki) and El Attaïa (Ataya); and on the south-western and most elevated part are the villages of El Abassia, Oulad Bou Ali (Bu Ali), Oulad el Kassem (Bel Kassim), Kellabine (Kelebine) and Oulad Yaneg (Uled Yanek). Except in the vicinity of Oulad Yaneg, where there are some low cliffs of clay, the coasts are everywhere low.

Île Rharbi (Gharbi) is the south-westernmost island, and on it is the village of Melita.

Maruka beacon, painted black and white in horizontal bands and 26 feet (7^m9) high, stands near the northern end of the banks, about 20 miles south-eastward of Ras Kaboudia.

El Barani beacon, painted the top part red and the bottom part white and 36 feet (11^m0) high, stands on the north-eastern side of the banks, about 7 miles south-south-eastward of Maruka beacon (*Lat.* 35° 10' N., *Long.* 11° 29' E.).

El Mzebla beacon, painted the top part red and the bottom part white and 26 feet (7^m9) high, stands near the eastern extremity of the banks, about 6 miles south-eastward of El Barani beacon.

Sakit Hamida beacon, painted the top part red and the bottom part white and 26 feet (7^m9) high, stands near the south-eastern extremity of the banks, about 7 miles south-south-westward of El Mzebla beacon.

Oued Bou Zrara (Wadi Bu Zrara) beacon, painted red and white in horizontal bands and 26 feet (7^m9) high, stands on the south-eastern side of the banks, about 5 miles west-south-westward of Sakit Hamida beacon.

Es Semoun (Smum) beacon, painted red and white and 49 feet (14^m9) high, stands on the southern side of the banks, about 22½ miles west-south-westward of Oued Bou Zrara beacon.

El Besh beacon, painted the top part red and the bottom part white and 26 feet (7^m9) high, stands on the south-western extremity of the banks.

Oued Mimoun (Wadi Mimoun) is entered about 8 miles west-south-westward of Oued Bou Zrara beacon. It affords access to the salt pans at El Abassia, and the channel across the bar has been dredged to a depth of 20 feet (6^m1) for a width of 100 feet (30^m5). This channel should not be attempted without local knowledge.

Oued es Semoun (Wadi Sadun) lies about 3½ miles westward of Oued Mimoun, and close westward of its entrance is a tripod beacon, 39 feet (11^m9) high, surmounted by two cones, points together.

Ras es Semoun (Smum), the southern extremity of Rharbi, lies about 12 miles west-south-westward of El Abassia, and on it stands Es Semoun beacon.

Light-buoys.—Eight light-buoys are moored off the seaward sides of Bancs Kerkennah:—

A conical light-buoy, painted black and white in diagonal stripes, surmounted by a double cross, marked "No. 1" and exhibiting a *white group flashing* light, showing *three flashes every twelve seconds*, is moored about 5½ miles north-north-eastward of Maruka beacon.

Charts 2158a and b.

Charts 249, 1162.

Four conical light-buoys, painted top half red and bottom half white, each surmounted by two cones, bases together, and marked, respectively, "No. 2," "No. 3," "No. 4" and "No. 5," are moored
5 about 8 miles north-north-eastward, $9\frac{1}{2}$ miles east-north-eastward, 12 miles eastward and 14 miles south-south-eastward of El Barani beacon. "Nos. 2 and 5" each exhibit a *red occulting light every one and a half seconds*; "No. 3" exhibits a *red group flashing light, showing three flashes every twelve seconds*; and "No. 4" exhibits a *white*
10 *occulting light every six seconds*.

Two can light-buoys, painted red and white in horizontal bands, each surmounted by two cones, points down, and marked, respectively, "No. 6" and "No. 7," are moored about 7 miles south-westward and $19\frac{1}{2}$ miles west-south-westward of Oued Bou Zrara beacon. "No. 6"
15 exhibits a *red group flashing light, showing two flashes every nine seconds*, and "No. 7" exhibits a *red group occulting light, having two eclipses every nine seconds*.

A conical light-buoy, painted red and white in diagonal stripes, surmounted by a double cross, marked "No. 8" and exhibiting a *white*
20 *group flashing light, showing three flashes every twelve seconds*, is moored about 5 miles south-south-westward of Ras el Besh beacon (*Lat. 34° 32' N., Long. 10° 58' E.*).

Directions.—Anchorage.—If the weather is too thick to navigate from light-buoy to light-buoy, vessels should keep in depths of more
25 than 10 fathoms (18^m3). At all times, when in the vicinity of the banks, sounding should be continuous.

Bancs Kerkennah, in common with all similar shoals off the coast of Tunisia, possess one remarkable characteristic, due to the bottom being covered with a thick growth of seaweed and its slope being very
30 gentle; the swell from the offing, however heavy it may be, diminishes rapidly in depths less than 8 fathoms (14^m6), so that, whatever the weather, a vessel may anchor in absolute safety, in depths of $3\frac{3}{4}$ fathoms (5^m9) and less. The holding ground, in general, is good, but it is advisable to veer plenty of cable, for in some parts the bottom
35 consists of soft sandy mud, and in others the weed is so thick that the anchor can obtain little hold, so that in either case, vessels are liable to drag.

Canal des Kerkennah. — Buoyage. — Light. — This channel, between a low coast fringed with shoals and devoid of landmarks, on
40 the one hand, and the Bancs Kerkennah, on the other, is available only to vessels drawing less than 10 feet (3^m0).

Chenal de la Louza (El Luza) is a narrow tortuous channel available for vessels drawing up to 13 feet (4^m0), which leads from the northern end of Canal des Kerkennah to a deep between that channel and
45 the coast.

No. 0 conical light-buoy, painted black, fitted with a radar reflector and exhibiting a *white occulting light every six seconds*, is moored on the north-western side of the northern entrance to Canal des Kerkennah, about 11 miles south-south-eastward of Ras
50 Kaboudia.

A red can buoy, surmounted by a cylinder and marked "K2," is moored on the north-western edge of Bancs Kerkennah, about 7 miles westward of Maruka beacon.

A black conical buoy, surmounted by a cone and marked "K1,"

Charts 2158a and b.

Charts 249, 1162.

is moored on the south-eastern side of the channel about 14 miles west-south-westward of Maruka beacon.

A red can buoy, surmounted by a cylinder and marked "K3," is moored on the south-eastern side of the channel about 16 miles west-south-westward of Maruka beacon. 5

The south-western part of the channel is marked by the continuation of the series of buoys marking *Chenal de la Louza*, of which those on the south-eastern side have odd numbers, are painted black and are surmounted by cones, while those on the north-western side 10 have even numbers, are painted red and are surmounted by cylinders.

A light is exhibited, at an elevation of 16 feet (4^m0), from a red tank on a red tripod beacon situated on the south-eastern side of the channel about 4½ miles northward of Ras Sidi Yusuf (*Lat.* 34° 39' N., *Long.* 10° 58' E.), the western extremity of Île Rharbi. 15

Directions.—Anchorage.—A vessel using Canal de Kerkennah must be guided by the light, light-buoys and buoys, for no landmarks are available.

No vessel without local knowledge should attempt *Chenal de la Louza*. 20

Good anchorage can be obtained, in all weather, by vessels drawing up to 23 feet (7^m0), in a deep on the western side of the northern end of Canal des Kerkennah. With northerly or north-easterly winds, the best berth is, in depths of about 4 fathoms (7^m3), with Tour Kredidja bearing 345°, distant 10 miles. At other times anchorage 25 can be taken as convenient, but care should be taken to avoid some holes, with depths of from 11 to 14 fathoms (20^m1 to 25^m6).

A vessel approaching the anchorage, by day, should make Tour Kredidja or No. 1 light-buoy off the northern end of Bancs Kerkennah, and then proceed to No. 0 light-buoy. 30

At night a vessel should steer to pass at least 5 miles eastward of Ras Kaboudia, care being taken to avoid being set on to the bank extending south-south-eastward of that point by the tidal stream. Thence, sounding continually, she should steer towards No. 0 light-buoy. 35

Tidal streams.—The flood stream appears to come from north-eastward or eastward, and, flowing across the banks, enters Canal des Kerkennah from either end. The ebb stream sets in the reverse direction. Thus, when proceeding along the north-eastern and south-eastern sides of the banks, caution must be exercised, for the tidal 40 stream may set directly on to the banks.

On the outer edges of the banks, the tidal streams turn about the time of high and low water, and the maximum rate, attained at about half tide, does not exceed one knot.

In Canal des Kerkennah the tidal streams are stronger, and may 45 attain a rate of 2 knots; they turn from 2 to 3 hours after high and low water, and attain their maximum rate shortly before the time of high and low water. They set fairly through the channel, and meet about the middle of it, where they are irregular.

Sfax.—Light.—This town had a population of about 75,000, in 50 1948. It is situated on the coast midway between Pointe Sidi Mansour (Mansur), about 29 miles south-south-westward of Ras Kaboudia, see chart 249, and Ras Tina, about 12 miles farther south-south-westward. Its white buildings are dominated by a tall minaret, by

Charts 2158a and b.

Charts 249, 1162.

the green-roofed tower of the town hall, and by a dome situated near the water-front in the inner part of the harbour. Some large sheds and an overhead transporter on the quay show up well from seaward.

- 5 Inland of the town, a plain extends to the foot of some hills, from 300 to 500 feet (91^m4 to 152^m4) high, about 9 miles from the coast, *see* chart 249. The most noticeable summits in these hills, namely the rounded Chéridi (Tuel Shridi), on which is a geodetic pillar, and Sidi Bou Ketheir (Bu K'tir), on which is a shrine, are not easily
10 identified.

About 1½ miles south-south-westward of the town, stand two conspicuous chimneys. In 1946, a conspicuous palm tree stood about 6½ cables westward of these chimneys.

- Within 15 miles south-westward of the town, and visible from
15 seaward, are Sidi Abid, the lighthouse and hillocks on Ras Tina, Sidi Mohamed Bou Akrazine (Bu Akazin), and, south-westward of the ruined village of Nakta, a grey cylindrical reservoir, on a white pedestal, situated close to a clump of trees.

- A light is exhibited, at an elevation of 182 feet (55^m5), from a blue
20 circular tower, the lower part of which is painted yellow, 145 feet (44^m1) in height, situated in front of a white rectangular building on a hillock about 1½ miles westward of Ras Tina.

- Harbour.—Light.—Beacons.—Buoyage.**—This harbour. (*Lat.* 34° 44' N., *Long.* 10° 46' E.) consists of three basins faced with quays.
25 The outer basin had, in 1949, been dredged to a depth of 29 feet (8^m8), and there were depths of 30 feet (9^m1) alongside the north-eastern, and of 28 feet (8^m5) alongside the north-western quays, both of which are connected with the railway. Basin Voiliers, on the south-western side of the outer basin, had, in 1949, been dredged to
30 a depth of 21 feet (6^m4). A small basin, which, in 1949, had been dredged to a depth of 15 feet (4^m6), opens off the north-western side of Basin Voiliers.

In 1949, works were in progress eastward of the entrance to the outer basin.

- 35 A channel, which, in 1949, had been dredged to a depth of 26 feet (7^m9), for a width of 130 feet (39^m6), leads to the entrance to the outer basin. It is marked by beacons.

- A light is exhibited, at an elevation of 58 feet (17^m8), from a column surmounting a hut, 16 feet (4^m9) in height, the upper part painted
40 black and the lower part grey, with a white horizontal band in the middle, situated on the north-western quay on the prolongation of the axis of the dredged channel.

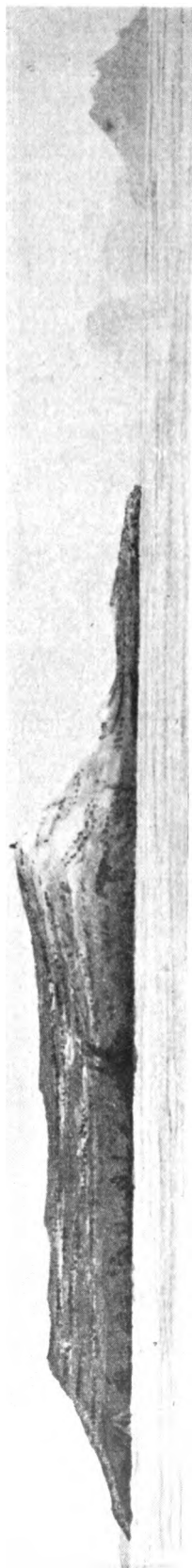
- A conical light-buoy, painted black and white in chequers, surmounted by a black cone and exhibiting a *green occulting light every*
45 *six seconds*, marks the north-eastern side of the seaward end of the dredged channel.

A conical light-buoy, painted red, surmounted by a red cylinder and exhibiting a *red occulting light every six seconds*, marks the south-western side of the seaward end of the dredged channel.

- 50 **Anchorage.—Caution.—Pilotage.**—The roadstead off Sfax affords anchorage completely sheltered from all winds; when a fresh breeze is blowing, however, it is prudent to veer ample cable.

Vessels usually anchor with the tall minaret in line with the light-structure on the quay, bearing 310°.

Chart 2158a.



Ras ed Drab.

Signal station.

Cap Bon from eastward.

(Original dated prior to 1913.)

*Cap Bon,
bearing 263°, 8½ miles.*

Zembra.



*South-eastern
summit, bearing
248°, 31 miles.*

Djebel Tebaga Fatnassa from east-north-eastward.

(Original dated 1926.)

*North-western
summit.*



*Punta
Pollara.*

*Punta Limarsi,
bearing 355°, about 1½ miles.*

Isola di Pantelleria from south-south-eastward.

(Original dated 1936.)



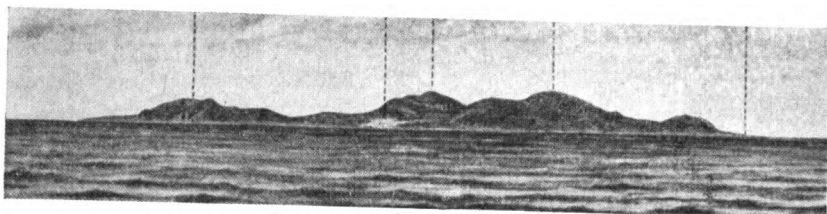
Punta Spadillo
lighthouse.
(Original dated 1942.)



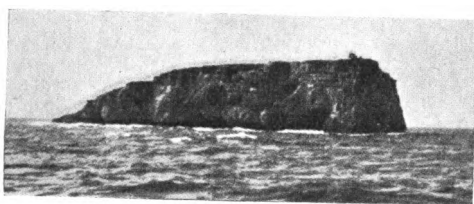
Punta Beppe
Tuccio lighthouse.
(Original dated 1942.)



Capo Grecale
lighthouse.
(Original dated 1936.)



Monte Vulcano,
bearing 087°, 5½ miles.
Isola di Linosa from southward.



Islet, bearing 106°.



Lighthouse, bearing 295°. Landing place.
Two views of Lampione.
(Originals dated 1936.)

Charts 249, 1162.

Vessels should not anchor in the vicinity of the submarine telegraph cable, *see* page 19, the route of which is indicated on the chart by a wavy line. A mooring buoy is situated on the route of the cable, about $1\frac{1}{2}$ miles southward of the light-buoys. 5

Pilotage, *see* page 20, is compulsory for all vessels over 100 tons entering the basin. The pilot should be embarked in the roadstead, before entering the dredged channel.

A vessel arriving at night should anchor in the roadstead. Pilotage at night is (1949) prohibited. 10

Tidal streams.—In the roadstead off Sfax, the flood tidal stream sets north-eastward, and the ebb south-westward; at springs they may attain a rate of one knot.

The direction of the tidal stream changes shortly before the time of half tide, and the greatest rate is attained shortly before high and 15 low water.

The tidal streams set across the dredged channel, and are appreciable to within about half a mile of the entrance of the basin.

Life-saving.—Life-saving appliances are maintained at Sfax (*Lat. 34° 44' N., Long. 10° 46' E.*); *see* page 15. 20

Port facilities.—**Signals.**—Signals regulating entry and exit, *see* page 14, are shown.

Storm signals are shown, *see* page 12, but only when the velocity of the wind is expected to exceed 20 knots.

A British Consular officer resides here. 25

There is a hospital.

Water is laid on to the quays. A stock of coal is maintained. Two tugs are available. There are numerous cranes up to 60 tons capacity. For deratisation, *see* page 22.

Chart 249. 30

Coast.—From Ras Burmada, *see* page 362, the coast trends about 11 miles south-westward to Ras Yonga (Ungha), and is low and marshy.

Mahares is a village on the coast about $2\frac{1}{2}$ miles westward of Ras Burmada; in it there is a minaret. 35

Bordj Yonga (Ungha) is a square fort, flanked by four towers, situated on the coast about 5 miles south-south-westward of Mahares, and northward of it there are three shrines.

Anchorage.—Anchorage sheltered from winds from west, through north, to north-east, can be obtained off Mahares. 40

The holding ground is good, and vessels can anchor according to draught, with the fort at Mahares bearing 000°.

Golfe de Gabès.—**Aspect.**—Golfe de Gabès is entered between Ras Yonga and Île de Djerba (Jerba), about 37 miles south-south-eastward; its shores are backed by hills with mountains behind 45 them. On the shore at the middle of the head of the bay is the town of Gabès. A conspicuous mosque stands near the head of a creek about $1\frac{1}{2}$ miles west-north-westward of Ras Yonga.

Djebel er Roumana (Rumana) and Djebel Tebaga Fatnassa (Meïda), 558 and 902 feet (170^m1 and 274^m9) high, respectively, lie within 50 8 miles of the coast about 30 miles south-westward of Ras Yonga. From eastward these hills appear flat-topped, but from south-eastward, they appear as two sharp peaks. *See* view facing page 366.

Djebel Bou Hedma rises to an elevation of 2,592 feet (790^m0) in

Charts 2158a.

Chart 249.

a range of mountains about 27 miles north-north-westward of Djebel er Roumana. From eastward these mountains present two large summits and a smaller one, which latter from south-eastward appears
5 as a cone.

Djebel ed Dissa, on the summit of which stands a prominent structure, rises to an elevation of 482 feet (146^m9), about 6 miles westward of the town of Gabès (*Lat. 33° 53' N., Long. 10° 06' E.*).

Zemlet el Guéloua (Jebel el Haluga) attains an elevation of 803 feet
10 (246^m9), about 6 miles south-south-westward of Djebel ed Dissa.

Djebel Matmata (Metmata) is a range of mountains about 23 miles southward of the town of Gabès. Near the north-western and south-eastern ends of this range Kalaa Matmata (Ballon) and Argoub ez Zmertene (Smerten), respectively, rise to elevations of 1,690 and 2,339
15 feet (515^m1 and 712^m9).

Djebel Tadjera Khir (Tajera), 886 feet (270^m0) high and surmounted by a structure, and Kef Mzem Zem (Demœr), 2,261 feet (689^m1) high, are situated at the south-eastern end of this mountainous region, about 13 miles eastward and 8½ miles southward, respec-
20 tively, of Argoub ez Zmertene.

Coast.—Dangers.—Light.—Buoyage.—Between Ras Yonga and Presqu'île Khedime, a small projection about 11 miles south-westward, the marshy coast is fronted by a bank of mud and weed, that dries and extends as much as 6 miles offshore in places; it is covered with
25 fishing stakes.

Îlots Sur-Kenis lie on the eastern part of the above-mentioned bank and consist of Îlot Kneiss (Neis), which is not easy to distinguish, and three low, rocky islets, the northernmost of which can be identified by a white cliff.

30 The south-eastern edge of the bank is marked by two beacons. The north-eastern beacon is painted the top part red and the bottom part white, surmounted by two cones, base to base, and marked "No. 2." The south-western beacon is painted red and white in horizontal bands, surmounted by two cones, points down, and is marked "No. 4."

35 A conical buoy, painted red and white in horizontal bands and marked "S.K.," is moored off the southern extremity of a shallow spit extending from the south-western end of the bank, about 6 miles southward of Presqu'île Khedime.

Baie des Sur-Kenis is entered between the above-mentioned bank
40 and the coast southward of Presqu'île Khedime. Its western shore consists of rugged cliffs of red clay intersected by deep ravines, at the southern end of which, at an elevation of 120 feet (39^m0), are the ruins of a tower, about 8 miles south-south-westward of Presqu'île Khedime.

La Skhirra (Skira) is a village situated about the middle of the
45 western side of the bay and 2½ miles west-north-westward of it is Sidi Mehdebb (Mehdœb).

A light (*Lat. 34° 17' N., Long. 10° 05' E.*) is exhibited, at an elevation of 71 feet (21^m6), from a yellow, square tower, with a black top, attached to a dwelling, 33 feet (10^m1) in height, situated near the
50 custom house at La Skhirra.

Oued Rann flows through the banks south-westward of Îlot Kneiss into the middle of the eastern side of Baie des Sur-Kenis; there is a bar at its mouth across which there is a narrow channel with a depth of 10 feet (3^m0); within the bar, there are depths of from 5½ to 6½

Chart 249.

fathoms (10^m1 to 11^m9). The channels both across and within the bar are marked by beacons, but local knowledge is necessary.

Anchorage.—**Directions.**—Baie des Sur-Kenis affords excellent sheltered anchorage at all times. Anchorage can be obtained about half a mile offshore abreast La Skhirra, in depths of from 3½ to 3¾ fathoms (5^m9 to 6^m9), mud and good holding ground, or at the head of the bay. 5

A vessel approaching from north-eastward should keep well clear of the bank forming the eastern side of the bay, until Djebel Tebaga 10 Fatnassa bears 250°, whence she may steer for it on that bearing, until the ruined tower on the southern end of the cliffs can be steered for, bearing 280°. This will lead about one mile southward of the buoy off the southern end of the spit extending from the bank, and when abreast the buoy she should steer towards La Skhirra. 15

At night, or in bad visibility, a vessel should be guided by the soundings, observing that on the eastern side of the bank the depths are very regular. Having run down the eastern side of the bank, as soon as the 10-fathom (18^m3) line on the eastern side of a deep which runs in towards the southern end of the bank has been crossed the vessel should steer about 248° for 8 miles, whence she should steer 20 325°, to make the cliffs southward of La Skhirra.

Coast.—Southward of the ruined tower southward of La Skhirra, the coast becomes low and is fringed with mudbanks, which dry out about one mile offshore in places. 25

Oued Akarit, with low cliffs on either side of its mouth, flows into the gulf about 11 miles southward of La Skhirra, and southward of it the coast becomes a little higher. The mouth of Oued Um el Gramm and the ruins of Tarf el Ma lie, respectively, about 4 miles northward and 2½ miles southward of the mouth of Oued Akarit. 30

The oases of Oudref (Udref), Metouia (M'Tuia), Rhennouch (Grenus), and Bou Chemma (Bu Shema) are visible from seaward, and lie within 3½ miles of the coast between the mouth of Oued Melah, which has some buildings on its banks, and is situated about 6½ miles southward of the mouth of Oued Akarit, and the town of Gabès. 35

Anchorage.—Small vessels, with local knowledge, can obtain anchorage, in depths of about 2½ fathoms (4^m1), within one mile of the coast between the mouth of Oued Um el Gramm and a position about 3 miles southward of Tarf el Ma; in the vicinity of Tarf el Ma, landing is easy for the beach does not dry out to any great extent. 40

Gabès.—**Dangers.**—**Lights.**—**Buoyage.**—The town of Gabès, which had a population, in 1948, of about 50,000, stands on the southern side of an oasis about 24 miles southward of La Skhirra; on a hill, 187 feet (57^m0) high, about 2 miles inland and 2½ miles southward of Gabès, is Sidi Ahmed (*Lat.* 33° 51' N., *Long.* 10° 06' E.). 45

The coast in the vicinity of the oasis is fringed by a sandbank, which, with depths of less than 3 fathoms (5^m5), extends as much as half a mile offshore in places. A detached patch, with a depth of 2½ fathoms (4^m1), lies about 4½ cables northward of the entrance to the harbour at Gabès. A 5-fathom (9^m1) patch lies about 2½ miles 50 northward of the harbour entrance.

The harbour at Gabès lies southward of the mouth of Oued Gabès, and is protected by two parallel rubble breakwaters, one on either side of the entrance. The entrance channel is about 85 feet (25^m9)

Chart 2158a.

Chart 249.

wide, and, in 1947, there was a sandbank, awash, in the middle of it. At low water, the landing steps at the custom house can only be approached in small boats.

- 5 A light is exhibited, at an elevation of 44 feet (13^m4), from a white, octagonal tower, with a black dome, surmounting a dwelling, 36 feet (11^m0) in height, situated near the root of the south-eastern breakwater.

A light is exhibited, at an elevation of 16 feet (4^m9), from a red, iron, framework structure, 13 feet (4^m0) in height, situated on the head of the north-western breakwater.

A light is exhibited, at an elevation of 16 feet (4^m9), from a black, iron, framework structure, 13 feet (4^m0) in height, situated on the head of the south-eastern breakwater.

- 15 A white conical buoy is moored off the entrance to the harbour; it is used as a warping buoy.

Three white buoys with blue crosses, marked "ZD," indicate the danger area of a firing range within one mile of the coast from 2 to 4 miles south-eastward of Gabès.

- 20 **Anchorage.**—Anchorage can be obtained east-north-eastward of the entrance to the harbour at Gabès, but the holding ground is very bad.

In summer, with easterly winds, communication with the shore is often difficult owing to the surf at the harbour entrance.

- 25 **Signal.**—When entry into the roadstead at Gabès is prohibited, a red light is exhibited at the signal mast.

Life-saving.—Life-saving appliances are maintained at Gabès; see page 15.

- 30 **Port facilities.**—**Communications.**—There is a hospital. For deratisation, see page 22.

Coasting steamers call regularly.

- Coast.**—**Dangers.**—The coast south-eastward of Gabès is low and flat for a short distance and then changes to dunes, which extend as far as the mouth of Oued es Sourrag (Srag), about 4 miles south-eastward. The mouth of Oued es Sourrag (*Lat.* 33° 50' N., *Long.* 10° 10' E.) is encumbered with shoals, and south-eastward of it the coast is backed by a chain of low hills a short distance inland.

- The oasis at Kettana (Ketena), close northward of which is Sidi Toumi (Tumi), lies 2½ miles inland about 5½ miles southward of the 40 mouth of Oued es Sourrag, and is visible from seaward.

Abreast Sidi Toumi, depths of less than 3 fathoms (5^m5) are found as much as 1½ miles offshore. The main light at Gabès is obscured over these dangers bearing more than 304°. A detached 5-fathom (9^m1) patch lies about 3 miles offshore north-eastward of Sidi Toumi.

- 45 **Lagune Oum ez Zessar** (Sebkha Mezessar) lies close to the coast about 20 miles south-eastward of Gabès, and eastward of it the coast, as far as Ras el Djerf (Tarf el Jorf), about 12 miles east-north-eastward, gradually becomes higher. This stretch of coast is fringed with shoals extending 2½ miles offshore in places, especially in the approaches 50 to Canal d'Adjim (Ajim).

Île de Djerba.—**Dangers.**—**Lights.**—**Buoyage.**—Île de Djerba (Jerba) is separated from the mainland by Mer de Bou Grara (Bahiret el Bu Grara), see page 373, the western entrance of which is Canal d'Adjim (Ajim). This island is fairly low, except in its centre, where

Chart 2158a.

Chart 249.

some hills, with cliffs on their southern sides, rise to elevations of about 100 feet (30^m5).

Northward of Canal d'Adjim, the western coast of the island is fringed in places with small rocky patches. 5

Sidi Taoussakret (Tusserk), situated on the coast about 2½ miles northward of Ras el Djerf, is a cylindrical tower. Cheikr Yahia (Sidi Yaya), about 1½ miles farther northward, consists of two shrines close together. Sidi Djemour (Jamur), about 3 miles farther northward, is square and has a small spire. Bordj Djellidj (Jilij), on the north- 10 western extremity of the island, about 3½ miles still farther northward, is a small, square fort.

A bank, with depths of less than 3 fathoms (5^m5), extends about 2 miles north-westward from the coast in the vicinity of Bordj Djellidj.

A light is exhibited, at an elevation of 52 feet (15^m8), from a white 15 octagonal tower, the upper part of which is painted black, 39 feet (11^m9) in height, situated on the north-western corner of Bordj Djellidj.

The most prominent objects on the northern side of Île de Djerba are :—Sidi Salem, with a palm tree close to it, about 4½ miles east- 20 ward of Bordj Djillidj. Bordj el K'bir at Houmt Souk, *see* page 372, about 2 miles south-eastward of Sidi Salem. The water tower at Houmt Souk (Humt-Suk). Sidi Smar, about 2½ miles east-south-eastward of Bordj el K'bir. Sidi el Hachchani Ashem, on Ras Rmel (Remœl), with 2 palm trees close to it, about 2 miles east-north- 25 eastward of Sidi Smar. Sidi Zekri, Sidi Bakkour (Bakur), and Sidi Sliman, situated, respectively, 2½, 3½ and 5½ miles south-eastward of Sidi el Hachchani Ashem. Of the last three, the first consists of two shrines close together and the last is a cylindrical tower. In the interior there are numerous minarets. 30

The northern side of Île de Djerba is fronted by a bank of mud and weed, which, with depths of less than 3 fathoms (5^m5), extends as much as 3 miles offshore in places. Heavy seas are raised off the north-eastern edge of this bank by the slightest breeze. Ras Rmel (Remœl) lies about 9½ miles eastward of Bordj Djellidj. 35

A light-buoy, painted black and white in vertical stripes, surmounted by a St. Andrew's cross and exhibiting a *white occulting* light, *every six seconds*, is moored about 6 miles north-eastward of Bordj Djellidj. Depths of less than 6 fathoms (11^m0) extend about 3 miles seaward of this light-buoy. 40

A buoy, painted black and white in horizontal bands, surmounted by two cones, points up, and marked "Ras Rmel," is moored on the edge of the bank about 3 miles north-north-westward of Ras Rmel.

Ras Taguermess (Turgeunness), the north-eastern extremity of the island, lies about 7½ miles south-eastward of Ras Rmel, and should be 45 given a berth of at least 2 miles, as it is fringed with shoals.

A light (*Lat.* 33° 49' N., *Long.* 11° 03' E.) is exhibited, at an elevation of 210 feet (64^m0), from a white tower with red horizontal bands; 161 feet (49^m1) in height, situated on a hill about 6 cables westward of Ras Taguermess. 50

Sidi Garouz (Garus) lies about 2½ miles southward of Ras Taguermess, and the point on which it is situated is fringed with shoals. Between Sidi Garouz and Ras Marmour, *see* page 373, about 9 miles southward is a bay across the entrance to which a spit, with depths

Chart 249.

of from $4\frac{1}{2}$ to $4\frac{3}{4}$ fathoms (8^m2 to 8^m7), extends about $5\frac{1}{2}$ miles southward from Sidi Garouz.

The most prominent objects on the south-eastern side of Île de Djerba are a small, square fort at Arhir (Aghir), about $2\frac{1}{2}$ miles south-westward of Sidi Garouz, and Bordj Kastil, a square fort situated on the extremity of a low peninsula, about 5 miles south-south-westward of Arhir. Farther inland are several mosques, of which those at Magrezal, Satouri (Sottori) and Guemir are visible from seaward.

10 A light is exhibited, at an elevation of 22 feet (6^m7), from a platform on the fort, 16 feet (4^m9) in height, situated at Arhir.

Houmt Souk.—Light.—Buoys.—A channel, 82 feet (25^m0) wide, has been dredged, to a depth of 6 feet (1^m8), across the flats on the northern side of Île de Djerba to a small basin at Houmt Souk (Hunt-
15 Suk). There are depths of 7 feet (2^m1) in the basin.

The channel, which is only available by day to vessels with local knowledge, is entered southward of the light-buoy north-eastward of Bordj Djellidj, and is buoyed.

A light (*Lat.* $33^\circ 53' N.$, *Long.* $10^\circ 52' E.$) is exhibited, at an elevation of 33 feet (10^m1), from an iron column on a hut, 29 feet (8^m8) in height, situated on the shore close south-westward of the basin at Houmt Souk.

For deratisation, *see* page 23.

Coasting steamers call regularly.

25 **Anchorage.**—Except during strong westerly or north-westerly winds, anchorage can be obtained, as convenient, anywhere off the western coast of Île de Djerba.

The roadstead off Houmt Souk is off the edge of the bank on the northern side of the island. Vessels anchor, according to draught,
30 near the light-buoy north-eastward of Bordj Djellidj. The holding ground is excellent.

Anchorage can also be obtained off Arhir. It is sheltered from westerly and northerly winds, and the sea raised by easterly ones is deadened by the seaweed growing in the shoaler water.

35 **Tidal streams.**—The tidal streams round Île de Djerba flow parallel with the coasts. Off Houmt Souk, the flood tidal stream flows westward, and the ebbstream, eastward; a maximum rate of 2 knots is attained, which is sufficient to cause vessels to ride broadside on to the wind, and at times even stern to it. The tidal streams turn at
40 the times of high and low water.

Canal d'Adjim.—Dangers.—Lights.—Buoyage.—This buoyed channel, between the south-western end of Île de Djerba and the mainland, consists of a deep which skirts Ras el Djerf, *see* page 370, but is barred by shoals at either end, those at the western end being the
45 shallower.

Two buoyed passages, named Passe Ouest and Passe Nord, give access to the deep from Golfe de Gabès. The former has a least depth, near its western end, of 9 feet (2^m7), and the latter has a least depth, at its south-eastern end, of $6\frac{1}{2}$ feet (2^m0). Passe Ouest is
50 the one most used.

A vessel drawing 10 feet (3^m0) can always penetrate either passage when the tide is above mean sea level, but local knowledge is essential.

A light is exhibited, at an elevation of 16 feet (4^m9), from a black tripod situated at the entrance to Passe Ouest.

Charts 2158a and b.

Chart 249.

Ras el Djerf (Tarf el Jorf) consists of red clay cliffs, from 50 to 60 feet (15^m2 to 18^m3) high. On the coast about 1½ and 3½ miles westward, respectively, of the point are two, small, inconspicuous, pyramidal beacons. 5

Îlot Guettaïet el Baharia (Kataya islet) lies on the shoal bank extending off the south-western side of Île de Djerba, on the northern side of the deep northward of Ras el Djerf. This islet is low and inconspicuous.

Houmt-Adjim is a village situated about 1½ miles north-north-10 westward of the south-western extremity of Île de Djerba. The coast in this vicinity is fronted by a shallow bank. There is a landing place at Bordj d'Adjim about 3½ cables south-westward of Houmt-Adjim, with a depth of about 4 feet (1^m2) at its head; it is approached by a narrow channel marked by buoys and light-beacons. Close to 16 Houmt-Adjim there is a clump of trees which is visible from seaward.

A light is exhibited, at an elevation of 33 feet (10^m1), from a rectangular structure, 30 feet (9^m1) in height, situated on the roof of the landing place at Bordj d'Adjim.

Anchorage.—Small vessels, with local knowledge, can obtain 20 anchorage in Canal d'Adjim, south-westward of Bordj d'Adjim. The tidal streams at this anchorage attain rates of 3 knots at springs, but the holding ground, of muddy sand, is good and the anchorage is well sheltered.

Mer de Bou Grara.—**Light.**—Mer de Bou Grara (Bahiret el Bu 25 Grara), *see* page 370, affords good shelter to vessels able to penetrate it, but there are numerous shallow banks and detached shoals in it, many of which are marked by buoys or beacons.

The eastern entrance to this bay is very shallow, and is barred by the ruins of a causeway, which extends south-south-eastward from 30 Bordj el Kantara, about 3 miles westward of Bordj Kastil, to the mainland.

A light is exhibited at Bordj el Kantara; and another light is exhibited on the mainland about 3½ miles south-south-eastward of Bordj el Kantara. 35

Coast.—**Dangers.**—Ras Marmour, *see* page 371, lies at the northern extremity of a chain of hills, faced with cliffs, which backs the coast between it and Zarzis about 8½ miles south-south-eastward. This stretch of coast is fringed by rocks and a shoal bank extending about one mile offshore. Detached shoals, with depths of less than 5 fathoms 40 (9^m1), lie within 6½ miles of the southern part of this stretch of coast.

Zarzis.—**Light.**—**Buoy.**—This village can be identified by a large rifle butt south-eastward, and a shrine north-eastward of it. The custom house, on the coast about half a mile southward of Zarzis 45 (*Lat. 33° 30' N., Long. 11° 07' E.*), has a look-out on it, as has one of the houses in the village. There is a small fort at Zarzis. Two shrines at Ksar Zaouia (Zaouia), three-quarters of a mile northward, and Sidi Bou Tefaha (Bu Tfa), about 2 miles south-westward of the village, are visible from seaward. 50

Boats can land at a wooden pontoon situated about 3 cables south-westward of the lighthouse. A buoy is moored south-eastward of the lighthouse.

A light is exhibited, at an elevation of 49 feet (14^m9), from a white

Charts 2158a and b.

Chart 249.

octagonal tower, the upper part of which is painted black, 46 feet (14^m0) in height, situated near the custom house.

Anchorage.—Anchorage, sheltered from southerly and westerly winds, can be obtained, by vessels with local knowledge, off Zarzis. Vessels should anchor east-south-eastward of the custom house, as close inshore as their draught will permit.

Coast.—Beacon.—From Zarzis, the coast trends about 30 miles south-eastward to Ras Ajdir (Ashdir), and is low and backed by extensive lagoons.

Ras el Lemsa (Lems) lies about 7 miles southward of Zarzis, and on it is a hillock.

On one of several islets at the entrance of Bahiret el Biban, about 11 miles south-eastward of Ras el Lemsa, stands a fort.

Bahiret el Biban is entered by a narrow channel between the islet on which is the fort and that next eastward of it, but there is a bar at its entrance with a depth of 3 feet (0^m9). The tidal streams in the channel abreast the fort attain a rate of 4 knots at springs.

Between the entrance of this lagoon and Ras Ajdir is a chain of coastal hummocks, many of which are surmounted by ruins, but the only one that can be identified with certainty is that on Ras el Ketef, about 4 miles north-westward of Ras Ajdir, which stands on a white cliff.

El Koucha (Kusha), 43 feet (13^m1) high, is a hummock situated about 1½ miles westward of Ras Ajdir (*Lat.* 33° 10' N., *Long.* 11° 32' E.).

Ras Ajdir (Ashdir), on the boundary between Tunisia and Tripolitania, is surmounted by a masonry pyramid, 33 feet (10^m1) in height, surmounted by a white globe. This pyramid is inconspicuous, but three houses in the neighbourhood show up well from seaward.

For a description of the coast farther eastward, *see* Mediterranean Pilot, Vol. V.

Dangers.—Buoyage.—The coast between Zarzis and Ras Ajdir is fronted by a bank of sand and weed, with depths of less than 10 fathoms (36^m6), extending about 12 miles offshore, on which lie numerous shoals.

Banc el Biban, almost awash, extends from the coast between Ras el Lemsa and the entrance to Bahiret el Biban.

Ras Zira, the north-eastern extremity of Banc el Biban, lies about 13 miles east-south-eastward of Zarzis, and about one mile within its extremity is a white masonry tower with a red top, surmounted by two red cones, bases together, the top of which is elevated 18 feet (5^m5).

A light-buoy, painted black and white in horizontal bands, surmounted by two cones, points up, and exhibiting a *white occulting* light, *every six seconds*, is moored about 2½ miles north-eastward of the tower on Ras Zira.

Detached patches, with depths of from 4½ to 5 fathoms (8^m2 to 9^m1), lie within 12½ miles northward and north-north-eastward of Ras Ajdir.

Directions.—Anchorage.—A vessel navigating along this part of the coast should be guided by the soundings, and should not get into depths less than 10 fathoms (18^m3).

Anchorage can be obtained, in a depth of 4 fathoms (7^m8), on the

Chart 2158b.

Chart 249.

eastern side of Banc el Biban, about $8\frac{1}{2}$ miles 005° from the fort at the entrance of Bahiret el Biban, or in a depth of 3 fathoms (5^m5), with the fort bearing 235° , distant about 3 miles; the holding ground is excellent.

A vessel with local knowledge, drawing less than 10 feet (3^m0), can obtain sheltered anchorage in a small deep about 8 cables northward of Ras Ajdir. The entrance is marked by two posts, one on either side, and vessels should pass between them with the beacon on Ras Ajdir (*Lat.* $33^{\circ} 10' N.$, *Long.* $11^{\circ} 34' E.$) bearing 191° . The tidal streams set north-westward and north-eastward on the rising and falling tides respectively.

Chart 2158b.

CHAPTER IX

THE BANKS AND SHOALS IN THE CHANNEL BETWEEN TUNISIA AND SICILY—ISOLA DI PANTELLERIA, ISOLE PELAGIE AND THE MALTESE ISLANDS

Chart 165.

GENERAL REMARKS.—The channel which separates Tunisia from Sicily is about 80 miles wide, at its narrowest part between Cap Bon, *see* page 353, and Capo Feto, *see* page 414. In the channel there are several dangerous shoals.

Chart 252.

Banc de la Sentinelle.—*See* page 335.

Chart 250.

Skerki bank.—**Dangers.**—This bank, on which the bottom is coral, rock, sand and shells, lies between positions, respectively, about 20 miles north-eastward of Îles Cani, *see* page 346, and 45 miles westward of Isola Marettimo, *see* page 404. Skerki channel lies between this bank and Îles Cani.

Keith reef, the shoalest patch on the bank, lies about 44 miles northward of Cap Bon, and is composed of compact limestone. On it there is a small rock, covered with weed, which has a depth of less than 6 feet (1^m8), and is usually marked by breakers.

Sylvia knoll (*Lat.* 37° 55' N., *Long.* 11° 02' E.) lies on the north-eastern end of the bank about 7 miles north-eastward of Keith reef; it has a depth of 6½ fathoms (11^m9).

Biddlecombe patch, about 2 miles north-north-westward of Keith reef, has a depth of 3½ fathoms (6^m9).

Hecate patch, with a depth of 3½ fathoms (6^m9), lies about 6½ miles south-westward of Keith reef.

Locust patch, with a depth of 9 fathoms (16^m5), lies about three-quarters of a mile northward of Hecate patch.

The least known depth over the south-western part of the bank is 19 fathoms (34^m7).

The currents in the neighbourhood of Skerki bank, *see* page 9, being uncertain, both in rate and direction, and the shoal patches not being, at all times, marked by breakers, care should be taken to give the dangers on this bank a wide berth.

Chart 165.

Talbot shoal.—**Buoy.**—This small shoal, with a depth of 6 fathoms (11^m0), lies nearly in mid-channel, about 33 miles south-south-westward of Punta Libeccio, *see* page 404, and is steep-to. There are depths of 13 and 14 fathoms (23^m8 and 25^m6), situated, respectively, about

Charts 2158a and b.

Chart 165.

3½ miles north-north-eastward and 4½ miles northward ; a 17-fathom (20^m1) shoal lies about 14½ miles north-north-eastward ; and an 11-fathom (20^m1) patch lies about 4½ miles eastward of Talbot shoal.

A white conical buoy, surmounted by two cones, bases together, the position of which is approximate, marks Talbot shoal.

Chart 186.

Adventure bank.—Shoals.—Adventure bank, with depths of less than 50 fathoms (91^m4), lies between positions, respectively, about 15 miles northward of Isola di Pantelleria, *see* page 378, and 10 miles southward of Marsala, *see* page 413.

Pantelleria bank, with depths of from 6½ to 18 fathoms (11^m9 to 32^m9), lies on the southern part of Adventure bank, about 24 miles north-north-eastward of the summit of Isola di Pantelleria.

A shoal, with a depth of 15 fathoms (27^m4), was reported, in 1946, to lie about 32 miles north-north-eastward of the summit of Isola di Pantelleria.

Graham shoal and Terrible bank.—Currents.—Graham shoal (*Lat.* 37° 10' N., *Long.* 12° 44' E.), about 25 miles southward of Capo Granitola, *see* page 415, had, in 1942, a depth of 4½ fathoms (7^m8), broken lava rock. It lies near the western edge of an extensive bank, with depths of less than 100 fathoms (182^m9). A bank, with depths of from 36 to 42 fathoms (65^m8 to 76^m8), lies about 1½ miles southward of Graham shoal.

The currents in the vicinity of Graham shoal are irregular both in direction and rate ; they usually set south-eastward, but a north-east-going current, with a rate of 3 knots, is sometimes experienced.

Graham shoal is of volcanic origin. In June, 1831, H.M. Sloop *Rapid* passed over the locality and recorded earthquake shocks. In July of that year, the crater of the volcano appeared above the surface, and towards the end of August the land was about 180 feet (54^m9) high ; it then began to subside, and had disappeared by December. In January, 1832, there were depths of 2½ to 3 feet (0^m8 to 0^m9) over the spot, which, by 1863, had increased to 15 feet (4^m6). H.M.S. *Shearwater* found a depth of 3 fathoms (5^m5) in the position in 1870, and H.M. Surveying vessel *Sylvia* obtained depths of not less than 4 fathoms (7^m3) in 1885. The Italian surveying vessel *Washington* examined the locality in 1890, and, in 1925, a thorough examination, carried out by the Italian surveying vessel *Ammiraglio Magnaghi*, showed that no appreciable change had taken place since 1890.

Terrible bank, with a depth of 18 fathoms (32^m9), lies about 7 miles eastward of Graham shoal and occupies a large portion of the eastern part of Adventure bank. In 1928, H.M.S. *Bryony* found another 18-fathom (32^m9) patch about 9 miles north-eastward of Graham shoal.

Nerita patch, with depths of from 18 to 24 fathoms (32^m9 to 43^m9), lies about 6 miles south-south-westward of the shoalest part of Terrible bank. Pinne Marine patch, with depths of from 25 to 29 fathoms (45^m7 to 53^m0), lies about 12 miles east-south-eastward of the same part of Terrible bank. A depth of 10 fathoms (18^m3) was reported, in 1948, to lie about 16 miles southward of Nerita patch.

Patella bank, with depths of from 36 to 42 fathoms (65^m8 to 76^m8), and Alga bank, with depths of from 30 to 70 fathoms (54^m9 to 128^m0), lie outside the 100-fathom (182^m9) line, about 10 miles south-south-westward and 15 miles southward, respectively, of Capo Rossello (page 418).

Charts 1440, 2158a and b.

Chart 186.

ISOLA DI PANTELLERIA.—**General remarks.**—This island, *see* view facing page 366, is of volcanic origin, and is situated about 55 miles south-westward of Capo Granitola (page 415).

- 5 The island is situated on a bank, which, with depths of less than 100 fathoms (182^m9), extends about 2½ miles from its north-western side, and about three-quarters of a mile from its other sides. In October, 1891, a submarine volcanic eruption was observed, by the Italian Naval vessel *Bausan*, near the western edge of the bank, about 10 2½ miles west-north-westward of Punta San Leonardo, *see* below.

- On the island are the craters of numerous extinct volcanoes, and several streams of lava and pumice-stone. The mountains are higher in the south-eastern part of the island than in the north-western part, and at the summit of Montagna Grande, near the middle of the island, 15 an elevation of about 2,743 feet (836^m1) is attained. The slopes of the hills are dotted with huts and to a great extent covered with vineyards; wine, dried fish, and agricultural produce are exported.

- A signal station is situated, at an elevation of 804 feet (245^m1), on Monte Sant' Elmo, at the north-western end of the island, about 20 1½ miles south-south-eastward of Punta San Leonardo. In 1946, this signal station was no longer in use.

Chart 186, plan of Porto di Pantelleria.

- Porto di Pantelleria.**—This small harbour is situated at the north-western end of Isola di Pantelleria at the head of a bay, which 25 is entered between Punta della Croce, *see* page 381, and Punta San Leonardo, a low point about half a mile north-eastward. It is only available for small craft.

- The only conspicuous object in the port is a white building near Punta San Leonardo. Castello Relegati, on which there is a flagstaff, 30 is situated near the centre of the town and is in ruins. A large pink building about 2½ cables west-south-westward of Castello Relegati, and a chimney, about midway between it and the castle, are prominent landmarks (*Lat.* 36° 50' N., *Long.* 11° 57' E.).

- The port consists of an eastern and western harbour, divided by a 35 central breakwater which is quayed on the outer part of its north-eastern side. The eastern, and older, part of the harbour is also protected by a short breakwater on its north-eastern side; a rock awash lies close off the head of this breakwater. Quays extend from the southern side of this breakwater to the southern side of the harbour.

- 40 The remains of an ancient breakwater are situated in the eastern harbour between the breakwaters; the entrance lies between it and the head of the north-eastern breakwater and is about a quarter of a cable in width. There are depths of from about 7 to 13 feet (2^m1 to 4^m0) in the eastern part of this harbour; elsewhere it is shoal and foul.

- 45 The western harbour is protected from westward by an L-shaped breakwater projecting northward from Punta della Croce, the northern arm of which consists largely of boulders; a large wrecked crane on the western arm of the breakwater was a prominent landmark in 1946. Except for a small quay in the south-western corner of this 50 harbour, alongside which there are depths of from 6 to 9 feet (1^m8 to 2^m7), loading and discharging of vessels can only be carried out in its western part where head and stern chain moorings are buoyed in depths of 11 feet (3^m4) and over. The south-eastern corner of the western harbour is foul; elsewhere the general depths in it are from 8 to

Charts 165, 2158a and b.

Chart 186, plan of Porto di Pantelleria.

15 feet (2^m4 to 4^m6). In 1948, harbour works were in progress. In 1950, entrance was through a channel 23 feet (7^m0) wide, with depths of about 10 feet (3^m0), which was available only to small craft with local knowledge.

Dangers.—Directions.—A rock, with a depth of less than 6 feet (1^m8), lies off the entrance to the eastern harbour, about 1½ cables south-westward of Punta San Leonardo lighthouse. A rock, with a depth of 7 feet (2^m1), over which the sea breaks in a northerly swell, lies in the entrance to the western harbour, about half a cable eastward of a post situated on the eastern extremity of the northern arm of the western breakwater. A vessel entering should keep fairly close to the post on the breakwater, rounding it sharply; in 1946, a recommended clearing line consisted of the stern of a prominent two-masted stranded wreck in line, bearing 188°, with the western edge of a stone hut on the hill behind; the hut is obscured by the shoulder of the hill when bearing eastward of 209°.

In 1946, both harbours were much obstructed by visible wrecks. The bottom of the western harbour was very foul on account of wreck-age, cables and wires.

Lights.—A light (*Lat. 36° 50' N., Long. 11° 57' E.*) is exhibited, at an elevation of 43 feet (13^m1), from an iron structure on a quadrangular building, the top part of which is painted yellow and the bottom part white, 33 feet (10^m1) in height, situated about half a cable south-eastward of Punta San Leonardo.

A light is exhibited, at an elevation of 22 feet (6^m7), from an iron framework structure standing on a grey concrete base, 20 feet (6^m1) in height, situated on the head of the north-eastern breakwater of the eastern harbour.

A light is exhibited, at an elevation of 18 feet (5^m5), from a red iron framework structure, 16 feet (4^m9) in height, situated on the head of the remains of the ancient breakwater in the eastern harbour; the greater part of the light-structure is obscured from seaward by the central breakwater.

A light is exhibited from the head of the western mole of the eastern harbour.

Town. — Port facilities. — Communications. — The town affords few facilities, and, in 1946, the greater part was in ruins. There is a hospital. A pilot is available.

Regular steamer communication is maintained with Isola di Lampedusa, Trapani and Porto Empedocle.

Anchorage.—The anchorage off the harbour is dangerous with winds from between west and north-east. The bottom is sand and rock. A good berth is on an imaginary line joining the outermost above-water rocks off Punta San Leonardo and the head of the breakwater which extends northward from Punta della Croce, with the flagstaff on Castello Relegati in line with the head of the central breakwater. In calm weather, the bottom is visible and a sandy spot should be selected. The anchor should be buoyed.

Chart 186.

Coast.—Dangers.—Lights.—Punta Bue Marino is a low, dark, rocky point, about half a mile east-north-eastward of Punta San Leonardo. There are two coves close eastward of it.

Punta Karuscia lies about 1½ miles east-south-eastward of Punta

Charts 165, 2158a and b.

Chart 186.

Bue Marino, and about $6\frac{1}{2}$ cables farther south-eastward is Punta della Pozzolana.

- A small detached shoal, with a depth of 6 fathoms (11^m0), lies about
 5 $3\frac{1}{2}$ cables north-north-eastward of Punta della Pozzolana.

Punta Spadillo (*Lat.* $36^{\circ} 49' N.$, *Long.* $12^{\circ} 01' E.$), about $1\frac{1}{4}$ miles eastward of Punta della Pozzolana, is the rocky north-eastern extremity of a promontory, on the western side of which is a cove.

- A light is exhibited, at an elevation of 164 feet (50^m0), from a white
 10 circular tower on a white two-storied dwelling, 69 feet (21^m6) in height, situated on Punta Spadillo. *See* view facing page 367.

Punta Gadir lies about one mile south-eastward of Punta Spadillo, and on its southern side is a cove in which there is a small wharf, available to small craft, with local knowledge, only.

- 15 Punta Tracino is rocky and lies about $2\frac{1}{4}$ miles south-eastward of Punta Spadillo; Cala Tramontana and Cala Levante are situated one on each side of Punta Tracino. Close off Punta Tracino is a rocky islet. Landing can be effected in either cove, and in Cala Tramontana, the north-western cove, there is a small wharf.

- 20 A light is exhibited, at an elevation of 163 feet (49^m7), from a white hut 12 feet (3^m7) in height, situated on Punta Tracino.

The south-eastern coast of Isola di Pantelleria consists, for the most part, of high, precipitous cliffs.

- Scogli del Formaggio lie within one cable of the coast about $1\frac{1}{4}$ miles
 25 southward of Punta Tracino, and about half a mile southward of them is Punta Curtigliolo, which is fringed with rocks.

Punta Salina, with a cove in its southern side, lies about half a mile southward of Punta Curtigliolo, and close northward of it are two above-water rocks, the northern one, Faraglione Dietro Isola, high and conical, the southern one, Scoglio Salina, low and flat.

- 30 Punta Limarsi, about $1\frac{1}{4}$ miles south-westward of Punta Salina, is rugged and rocky; about midway between these two points lies Cala Rotondo, with a noticeable red cottage at its head. Between this cove and Punta Limarsi lies Porto Dietro Isola, a slight indentation.

- 35 A light is exhibited, at an elevation of 82 feet (25^m0), from a grey, cylindrical beacon, surmounted by a framework structure, 20 feet (6^m1) in height, situated on Punta Limarsi.

- Punta Sciaccazza lies about $1\frac{1}{4}$ miles westward of Punta Limarsi, and about midway between them there is a group of rocks within
 40 half a cable of the coast. Above the point stands a prominent white house.

Punta Polacca lies about one mile westward of Punta Sciaccazza, and about $6\frac{1}{2}$ cables north-westward of it is Porto di Nicà, available for boats only.

- 45 Secca di Nicà, with a depth of $6\frac{1}{2}$ fathoms (11^m9), rock, lies about $1\frac{1}{2}$ cables south-westward of the western entrance point of Porto di Nicà.

- Porto di Scauri, where there is a landing place and a wharf, lies about $1\frac{1}{4}$ miles north-westward of Porto di Nicà, and on the coast about midway between them is a prominent hill faced with cliffs
 50 about 300 feet (91^m4) high.

A light is exhibited, at an elevation of 60 feet (18^m3), from a grey, framework structure on a beacon situated on Punta Tre Pietre, *see* below.

Punta Tre Pietre, close westward of Porto di Scauri, has three small

Charts 165, 2158a and b.

Chart 186.

rocks at its extremity, and about $2\frac{1}{2}$ miles north-westward of it the coast rises as a remarkable wall of black lava.

Cuddie Rosse, a reddish-coloured hillock, near the coast, about $3\frac{1}{4}$ miles north-north-westward of Punta Tre Pietre, rises to an elevation of 184 feet (56^m1), and near it are some lime kilns. 5

From abreast Cuddie Rosse, a low, black, rocky coast, fringed with small rocks and shoals, trends north-north-eastward for about one mile to Punta della Croce. Southward of this point there is a cemetery, and behind it a factory with a black chimney and a tall crane. 10

Anchorage.—Small vessels, with local knowledge, can obtain anchorage, sheltered from westerly winds in a depth of about 16 fathoms (29^m3), rock and weed with patches of coarse sand, in Ancoraggio di Campobello, between Punta Karuscia and Punta della Pozzolana. Landing can be effected at a steep-sided rocky place, about 4 cables 15 south-south-eastward of Punta Karuscia.

Cala di Tramontana and Cala di Levante both afford anchorage to small vessels with local knowledge.

Porto Dietro Isola affords anchorage to small vessels, with local knowledge, in depths of from 12 to 15 fathoms (21^m9 to 27^m4), coarse 20 sand with some rocks.

Porto di Scauri affords anchorage to small vessels with local knowledge when that off the town of Pantelleria becomes untenable.

Chart 165.

ISOLE PELAGIE.—**General remarks.**—This group consists of 25 Isola di Linosa, Lampiona, and Isola di Lampedusa, and is situated south-south-eastward of Isola di Pantelleria and west-south-westward of the Maltese islands.

Chart 193, plan of Isola di Linosa.

Isola di Linosa.—**Danger.**—**Lights.**—This island lies about 30 65 miles south-eastward of Isola di Pantelleria, *see* chart 165. It is of volcanic formation, and attains elevations, at the summits of Monte Vulcano and Monte Rosso, in its south-eastern and north-eastern parts, respectively, of 640 and 610 feet (195^m1 and 185^m9), *see* views on chart 193 and facing page 367. With the exception of the rock off Punta 35 Calcarella, *see* below, there are no off-lying dangers.

Punta Balata Piatta (*Lat.* 35° 52' N., *Long.* 12° 52' E.) is the north-western extremity of the island, and close southward of it lies Cala Pozzolana di Ponente. Immediately southward of this cove is Scalo Vittorio Emanuele, or Scalo Nuovo, where landing can be effected on 40 the beach.

Punta Beppe Tuccio, the north-eastern extremity of the island, lies about $1\frac{1}{2}$ miles eastward of Punta Balata Piatta.

A light is exhibited, at an elevation of 105 feet (32^m0), from a white, cylindrical tower on a white dwelling, 56 feet (17^m1) in height, situated 45 on Punta Beppe Tuccio. *See* view facing page 367.

Faraglioni is an islet situated about 3 cables southward of Punta Beppe Tuccio. There are rocks in the narrow channel between it and the coast.

Punta Calcarella, the south-eastern extremity of the island, lies 50 about 11 cables southward of Punta Beppe Tuccio.

A detached rock, with a depth of 13 feet (4^m0), lies about 2 cables eastward of Punta Calcarella.

Charts 2158a and b.

Chart 193, plan of Isola di Linosa.

Punta Arena Bianca, the south-western extremity of the island, lies about one mile westward of Punta Calcarella. There is a village about 4 cables north-eastward of Punta Arena Bianca with Scalo

5 Vecchia, the principal landing place in the island, southward of it. A light is exhibited, at an elevation of 30 feet (9^m1), from an iron structure on a square, white, masonry hut, situated on Punta Arena Bianca.

Regular steamer communication is maintained with Trapani and 10 Porto Empedocle.

Anchorage.—None of the following anchorages affords security ; the bottom is in all cases mostly rocky, and vessels are advised to quit them before nightfall.

Cala Pozzolano di Ponente affords anchorage to small vessels, with 15 local knowledge.

Anchorage can be obtained by small vessels, with local knowledge, off Faraglioni.

Anchorage can be obtained, by vessels with local knowledge, between Punta Calcarella and Punta Arena Bianca.

20 *Chart 193, plan of Isola di Lampedusa and Scoglio Lampione.*

Lampione.—**Light.**—This islet lies about 32 miles south-westward of Isola di Linosa, *see* chart 165, and is about 130 feet (39^m6) high. It has a flat top and cliffy sides ; when seen from north-westward, it appears like a wall rising from the sea. It is steep-to, except on its 25 eastern side, where there are some rocks close inshore. *See* views facing page 367. Access to the summit (*Lat.* 35° 33' N., *Long.* 12° 20' E.) can be obtained on the south-eastern side of the islet.

A light is exhibited, at an elevation of 131 feet (39^m9), from a lantern on the roof of a square masonry hut, 20 feet (6^m1) in height, situated 30 on the western side of Lampione.

Isola di Lampedusa.—**Dangers.**—**Light.**—This island lies south-westward of Isola di Linosa with Capo Ponente, its western extremity, about 10 miles east-south-eastward of Lampione. It is barren, flat-topped, and of a white calcareous stone ; except at its south-eastern 35 end, where the land slopes gently to the sea, its sides are everywhere steep. The island attains an elevation of 436 feet (132^m9) at Monte Albero Sole, on the northern coast, about one mile east-north-eastward of Capo Ponente.

See view facing page 398.

40 On the southern side of the island are numerous caves and coves, the largest of which latter forms the principal harbour, *see* page 383.

Isola dei Conigli, about 2 miles east-south-eastward of Capo Ponente, is flat-topped, steep-sided, and 98 feet (26^m8) high ; it lies so close off the southern coast of the main island that it is not easily identified.

45 Some rocks, the outermost of which is dark, round-topped, and remarkable, lie on a shoal bank within one cable southward of Isola dei Conigli.

Capo Ponente is faced with whitish cliffs, and fringed with rocks, both sunken and awash, lying close inshore.

50 The northern coast of Isola di Lampedusa is free from off-lying dangers, but several rocks lie close inshore ; it is high, cliffy, especially under Monte Albero Sole, and nowhere can landing be effected.

Scoglio Faraglione, close eastward of Monte Albero Sole, is a high whitish rock.

Charts 3670, 165, 2158a and b.

Chart 193, plan of Isola di Lampedusa and Scoglio Lampione.

Punta Muro Vecchio, with an above-water rock on its western side, Punta di Taccio Vecchio, and Punta Alaimo are the three most salient points on the northern side of the island.

Capo Grecale, the north-eastern extremity of the island, lies about 5
4½ miles eastward of Monte Albero Sole.

A light (*Lat. 35° 31' N., Long. 12° 38' E.*) is exhibited, at an elevation of 213 feet (64^m9), from an octagonal tower, 56 feet (17^m1) in height, attached to a white, one-storied dwelling, situated on Capo Grecale.
See view facing page 367.

Punta Parrino lies about one mile southward of Capo Grecale and between them are four coves, of which Cala Creta and Cala Pisana are the largest. The former is surrounded by cliffs; landing can be effected at the head of the latter near a cemetery. There is a small quay, with depths of 10 feet (3^m0) alongside, in Cala 15
Pisana.

Punta Sottile, the south-eastern extremity of the island, is low and rocky, and lies about half a mile southward of Punta Parrino.

Anchorage.—The bight on the eastern side of Isola dei Conigli affords good anchorage to small vessels, with local knowledge, over a 20
sandy bottom.

Small craft, with local knowledge, can obtain open anchorage, with good holding ground, sheltered from east-south-easterly winds, off the coast between Capo Ponente and Punta Parise, about half a mile north-eastward. 25

Anchorage, sheltered from southerly winds, can be obtained, by vessels with local knowledge, close westward of Punta di Taccio Vecchio.

Ancoraggio di Cala Pisana, available to small vessels with local knowledge during south-westerly and north-westerly winds, is off or 30
in the entrance of Cala Creta.

Chart 193, plan of Porto di Lampedusa.

Porto di Lampedusa.—**Lights.**—Porto di Lampedusa, the principal harbour in Isola di Lampedusa, lies about 1½ miles westward of Punta Sottile. It is open south-south-westward and the 35
“Marrobio,” see page 9, sometimes renders it dangerous. It is entered between Punta Maccaferri, the western extremity of a headland, named Cavallo Bianco, and Punta Guitgia, about 1½ cables westward. Its shores are mostly rocky, though there are some sandy beaches. A monument, consisting of a grey stone pyramid, sur- 40
mounted by a cross, stands about 2 cables east-north-eastward of Punta Maccaferri.

The small town of Lampedusa stands on the north-eastern side of the harbour, and the inhabitants are mostly employed in sponge and sardine fishing. Regular steamer communication is maintained with 45
Trapani and Porto Empedocle.

A light is exhibited, at an elevation of 57 feet (17^m4), from a platform on a grey circular tower, 18 feet (5^m5) in height, situated on Punta Maccaferri.

A light is exhibited, at an elevation of 48 feet (14^m6), from a red 50
cylindrical beacon, surmounted by a framework structure, 23 feet (7^m0) in height, situated on Punta Guitgia.

Cala Salina lies at the head of the harbour, and on its eastern and western sides, respectively, are Cala Palma and Cala Guitgia. Cala

Charts 3670, 165, 2158a and b.

Chart 193, plan of Porto di Lampedusa.

Palma is the most frequented, and small craft are hauled up on the beach at its head. All three coves are shoal.

A light is exhibited, at an elevation of 16 feet (4^m9), from a red, iron column, with a ladder, 16 feet (4^m9) in height, situated on the head of a mole extending from a small quay close south-eastward of the health office.

Anchorage.—Anchorage can be obtained, off the entrance of the harbour, in a depth of about 8 fathoms (14^m6), good holding ground of sand and weed. The harbour itself is only available to small vessels with local knowledge.

Anchorage within the harbour is reported to be unsatisfactory, as the holding ground consists of sand and weed, and the low-lying surrounding land, in places, affords little protection from any wind.

15 *Charts 194, 3670, and 165.*

THE MALTESE ISLANDS.—General remarks.—Banks.—

This group consists of three islands and several islets, of which the former are named, from north-west to south-east, Gozo, Kemmuna and Malta.

20 The group lies on the western part of an extensive bank, with depths of less than 50 fathoms (91^m4). On the north-eastern side of the group, the edge of the bank is not more than 4 miles offshore, whereas on the south-western side, except in the vicinity of Filfla, *see* page 403, its maximum distance offshore is less than one mile.

25 Hurd bank, occupying a central position on the eastern part of the above-mentioned bank, has depths of from 22 to 30 fathoms (40^m2 to 54^m9), coral and sand, and lies between 8 and 12 miles east-north-eastward of the north-eastern extremity of Malta.

The Malta channel separates the Maltese islands from the eastern end of the southern coast of Sicily, and is about 45 miles wide. The depths in it are less than 100 fathoms (182^m9), and it is free from off-lying dangerous shoals.

Submarine exercise areas.—Caution.—Submarines engaged on exercises may be met with anywhere within 20 miles of the coasts of Malta and Gozo (*Lat.* 36° 02' N., *Long.* 14° 14' E.).

Population.—In 1948, the civil population of these islands was 306,896.

Chart 194.

GOZO.—General remarks.—This island, the second largest in the group, is known to the Maltese as Ghaudex. *See* view facing page 398.

It is almost entirely surrounded by perpendicular cliffs, those on its southern and western sides being very high. The island is hilly, attaining an elevation of 659 feet (200^m9) near its eastern end.

45 Rabat (Victoria), near the centre of the island, is the principal town; in addition there are several villages, and numerous detached houses. The whole island is well cultivated.

Near the coasts of the island are several towers and redoubts.

Northern side of Gozo.—Dangers.—Light.—Ras San Dimitri, the north-western extremity of Gozo, is high, bold and steep-to; from it the cliffy, steep-to coast trends about one mile eastward to Ras Ta Pinu, Ras il-Heqqa (el Hecca) being about midway between.

Charts 3670, 165, 2158a and b.

Chart 194.

Gordan, a prominent hill, lies about half a mile southward of Ras Ta Pinu and is 528 feet (160^m9) high.

A light is exhibited, at an elevation of 595 feet (181^m4), from a white tower, surmounting a dwelling, 71 feet (21^m6) in height, situated on the summit of Gordan. There is a signal station at the lighthouse, the flagstaff being close northward of it. 5

Qolla l-Bajda (Gholya Baida), 1½ miles eastward of Ras Ta Pinu, stands on a small promontory fronted by low cliffs and fringed with rocks extending a short distance offshore. Foul ground extends 1½ cables from the coast midway between Ras Ta Pinu and Qolla l-Bajda. On either side of the promontory there is a small bay, but the depths in both are shoal and their shores are fringed with rocks. Qolla l-Bajda is a remarkable, white, steep-sided mound, in the form of a truncated cone, 85 feet (25^m9) high, with a redoubt on its eastern side. 15

Ir-Ramla ta Marsalforn, half a mile south-eastward of Qolla l-Bajda, has depths of 3 or 4 fathoms (5^m5 or 7^m3) in the middle. At its head is a beach. Its eastern side is fringed with a reef, awash, and on the eastern side of its head is a small church with a spire. At the village there is a boat camber, with depths of 6 feet (1^m8). 20

Il-Qolla s-Safra (*Lat. 36° 04' N., Long. 14° 15' E.*), on the western side of Ir-Ramla ta Marsalforn, is a prominent, yellow, detached, steep-sided, conical hill, 205 feet (62^m5) high.

Il-Mirzuq, about half a mile southward of Il-Qolla s-Safra, is another noticeable hill, 320 feet (97^m5) high. 25

Charts 2623, 194.

From the eastern entrance point of Ir-Ramla ta Marsalforn, the coast trends about 2½ miles south-eastward to Il Gebel Tal-Mistra, and has the appearance of a tableland, bordered by precipitous reddish cliffs, from 250 to 350 feet (76^m2 to 106^m7) high, surmounting steep slopes covered with large boulders. This line of cliffs is broken by the cultivated valleys of Wied ir Ramla and Wied San Blas. Xaghra and Nadur, in each of which is a prominent church, together with several windmills, are situated on the tableland and are visible from seaward. 35

Ramla l-Kbira, at the mouth of Wied ir Ramla, is a remarkable sandy beach with a white statue in the centre. It is situated at the head of a bay, encumbered with shoals, the bottom of which is alternately white sand and rock, but temporary anchorage can be obtained by small craft with local knowledge. 40

Chart 194.

A bank, with depths of from 9 to 10 fathoms (16^m5 to 18^m3), rock, lies about half a mile east-north-eastward of Il Rajel, the eastern entrance point of the bay in which is Ramla l-Kbira. 45

Chart 2623.

Il-Qala Ta' San Blas lies at the mouth of Wied San Blas, and within 1½ cables of its south-western shore are two rocky patches, each with depths of 2 fathoms (3^m7). A detached 5-fathom (9^m1) patch lies in the middle of the bay.

Il Gebel Tal-Mistra is a bold point covered with large boulders that have fallen from the cliffs above. Torri ta Isopu, a square tower 44 feet (13^m4) in height, stands near the edge of the cliff above the point. 50

Ras Il-Qala, the south-eastern extremity of Gozo, lies about 2 miles

Charts 3670, 165, 2603, 2158a and b.

Chart 2623.

south-eastward of Il-Gebel Tal-Mistra, and is free from off-lying dangers; the coast between these two points becomes gradually less precipitous.

*Chart 194.*5 **Western and southern coasts of Gozo.—Dangers.—Light.—**

From Ras San Dimitri the western coast of Gozo trends about $1\frac{1}{4}$ miles southward to North point, and to within $3\frac{1}{2}$ cables of that point consists of high cliffs, free from off-lying dangers. Thence as far as the point, it is fringed by a shoal bank, extending about 2 cables offshore, the
10 edge of which is steep-to.

Chart 194, plan of Cala Dueira.

Qala Tad-Dwejra (Cala Dueira) is entered between North point and South point, $1\frac{1}{2}$ cables south-south-eastward, and has depths of from 17 to 45 feet (5^m2 to 13^m7). In the entrance to the cove is Fungus
15 rock, 166 feet (50^m6) high, the channels northward and southward of which are, respectively, about 100 and 200 feet (30^m5 and 61^m0) wide, with depths of 18 and 23 feet (5^m5 and 7^m0). Close northward of the cove stands a tower, at an elevation of 181 feet (55^m2).

Chart 194.

20 Ras il-Wardija (Cape Bombardo), the south-western extremity of Gozo, lies about half a mile southward of South point; it is a bold, perpendicular headland, 528 feet (161^m0) high, surmounted by a tower. From the cape, the southern coast of Gozo trends east-south-eastward and consists of cliffs higher than those forming the western coast of
25 the island.

Ras il Bajjada (Baydha), about $1\frac{1}{4}$ miles east-south-eastward of Ras il-Wardija, is fringed with rocks extending about one cable offshore, and is surmounted by a tower.

Qala Tax-Xlendi, on the northern side of Ras il Bajjada, has depths
30 of from 24 to 42 feet (7^m3 to 12^m8); in the middle of the entrance lies a rock, with a depth of 4 feet (1^m2).

Ras el Trebona and Ras el Newhela lie, respectively, about half a mile south-eastward and $2\frac{1}{4}$ miles east-south-eastward of Ras il Bajjada, and the coast between consists of steep, white cliffs, 160 feet
35 (48^m8) high, with numerous caves at their base. From Ras el Newhela, the cliffs trend about half a mile east-north-eastward to Mgar-ix-Xini (Mgarr ish Shini), and are steep-to.

Chart 2623.

Mgar-ix-Xini (Lat. $36^{\circ} 01' N.$, Long. $14^{\circ} 16' E.$) is a narrow inlet,
40 with a tower on its eastern entrance point.

L-Skoll tal Fessei, an islet 33 feet (10^m1) high, lies about $1\frac{1}{2}$ cables south-south-eastward of the above-mentioned tower, and from it a bank, with depths of 4 fathoms (7^m3), extends about half a cable north-westward.

45 Ras Il-Hobz (il Hobs) and Ponta tal Mellieha lie, respectively, about $1\frac{1}{2}$ and 7 cables eastward of L-Skoll tal Fessei; close north-eastward of the latter point stands Fort Chambray, at an elevation of 255 feet (77^m7).

Close eastward of Fort Chambray lies Ramla Tal-Imgarr, with Imgarr on its western side. This harbour is protected by a breakwater, which
50 extends about $1\frac{1}{4}$ cables north-eastward from the western entrance point of the bay. There is a smaller breakwater close northward of the larger one.

A light is exhibited, at an elevation of 27 feet (8^m2), from the head of the larger breakwater.

Charts 3670, 165, 2603, 2158a and b.

Chart 2623.

Close southward of the root of the larger breakwater are some rocks named Skol ta Ghasafar.

Il-Gebel Tac-Cawl (Jebba ta Chiaul) is an islet lying close inshore about one mile eastward of Fort Chambray, and the coast eastward of it forms the northern shore of Il Fliegu ta Ghaudex (Ghaudesh). 5

Jebel Tal-Halfa, 72 feet (21^m9) high, lies close inshore about three-quarters of a mile eastward of Il-Gebel Tac-Cawl. Within one-quarter of a mile westward of this islet there is a chain of above-water rocks, one of which is 10 feet (3^m0) high, lying about half a cable offshore. 10

From abreast Gebel Tal-Halfa the coast trends about 3 cables east-north-eastward to Ras il Qala.

Anchorage.—Temporary anchorage can be obtained, in a depth of about 10 fathoms (18^m3), sand, in the bay on the eastern side of Fort Chambray, with the church at Ghajnsielem, visible up the main 15 street of the village, bearing about 291°, and the outermost above-water rock under Fort Chambray in line with the southern extreme of Ponta tal Mellieha, bearing about 238°. This anchorage is exposed to the easterly winds which blow through Il Fliegu ta Ghaudex, and also to southerly and westerly winds. 20

KEMMUNA.—Channels.—Dangers.—This island lies between Gozo and Malta, and is separated from them, respectively, by Il Fliegu ta Ghaudex and Il Fliegu ta Malta. Close off its western side is the islet of Kemmunett. The currents in the channels on both sides of Kemmuna are irregular in direction, sometimes setting against a 25 strong wind, but their rate is usually less than one knot.

Kemmuna is fringed in places with rocks, and its irregular coasts are mostly cliffy. The soil is cultivated, and at its eastern end the island rises to an elevation of 245 feet (74^m7); near its south-western extremity is a hill, 229 feet (69^m8) high, surmounted by Torri ta Kemmuna. 30

Kemmunett is bare, rocky, and 93 feet (28^m3) high; several above-water rocks lie on a shoal bank between it and the north-eastern shore of Il Mats, *see* page 388, south-eastward of it. A bank, with depths of less than 3 fathoms (5^m5), extends about one cable north-westward from the north-western extremity of the islet: Palazz tal Marfa, *see* 35 page 389, open south-westward of Irqia point, with the latter bearing less than 140°, leads westward of this bank.

On the northern side of Kemmuna are some bays, but they are suitable for small craft only.

Ras tal Ghemieri (Imnieri) (*Lat.* 36° 01' N., *Long.* 14° 20' E.), the 40 north-eastern extremity of the island, lies about three-quarters of a mile southward of Ras Il-Qala, and within 1½ cables northward of it the depths are less than 5 fathoms (9^m1).

Ponta tal Merieha lies about 4 cables south-eastward of Ras tal Ghemieri and about half a mile farther in that direction lies the eastern 45 extremity of the island. The whole of the eastern side of the island consists of high cliffs, with many caves and scattered rocks at their base.

Charts 2623 and 2063.

Skoll tal Prosha is a rock, awash, lying on the foul ground which 50 fringes the eastern point of the island extending about one cable offshore; the cliffs there are 184 feet (56^m1) high.

Skoli tal Abjat tal Prosha, with a depth of 3 fathoms (5^m5), are three

Charts 194, 3670, 165, 2603, 2158a and b.

Charts 2623 and 2063.

rocky heads lying within 2 cables of the coast about 2 cables southward of Skoll tal Prosha. Sultan rock is the easternmost of the three and has a depth of $3\frac{1}{2}$ fathoms (6^m4). Palazz iz-Zghhir, *see* page 389, in line with the cliffs above Ras il Qammieh, *see* page 401, bearing 227°, leads about 3 cables south-eastward of these dangers. *See* view on chart 2623.

Chart 2623.

From abreast Skoli tal Abjat tal Prosha, the southern coast of 10 Kemmuna trends $1\frac{1}{4}$ miles westward to Irqika point (Irkieka ta Kemmuna) and is free from off-lying dangers; but vessels should not anchor off it, for the sandy patches are few and too close inshore.

Irqika point, the south-western extremity of Kemmuna, is a low, narrow point, that can be rounded at a distance of one cable.

15 Il Mats is a bay which is entered between Irqika point and Kemmunett, about half a mile north-north-westward.

Anchorage.—Anchorage can be obtained, in depths of from 9 to 12 fathoms (16^m5 to 21^m9), in Il Mats.

Chart 194.

20 **MALTA.**—**General remarks.**—This, the largest of the Maltese islands, called by the Maltese Melita, presents the appearance of an inclined plane, sloping gradually from the Bingemma hills, near the middle of its south-western side. Nadur tower (*Lat.* 35° 54' N., *Long.* 14° 22' E.) stands at an elevation of 786 feet (239^m6) on the 25 summit of these hills. The remainder of the surface of the island is covered with hills of moderate elevation, the steep slopes of which are terraced and cultivated.

The western and south-western coasts of the island consist for the most part of perpendicular cliffs, surmounted by steep slopes; the 30 remaining coasts are much indented by bays and creeks, the most important being the harbours of Valetta.

Malta contains three cities and many villages. Of the former, Mdina (Notabile) stands, with its cathedral, on rising ground south-eastward of the Bingemma hills, Valetta, the present capital and port, 35 is situated on the north-eastern coast, and Sliema is situated close north-westward of it.

Light.—Luqa light, for the use of aircraft, is exhibited, at an elevation of 340 feet (103^m6), about half a mile west-north-westward of the town of Luqa, nearly 3 miles south-westward of Valetta.

40 **Caution.**—No vessel is permitted, during night time, to make use of any private signals, off any bay or creek of the islands; the only authorised signals being :—

(a) A vessel requiring a pilot to burn a *blue* light.

(b) A vessel in distress to use the signal authorised under the

45 Merchant Shipping Act.

The following regulations govern the artillery practice from any fort on the islands of Malta and Gozo :—

A blue pendant over a red flag will be displayed at the work from which practice is to take place on the afternoon prior to such practice, and at 0700 on the day of the practice. The same signal will be 50 displayed from the launch leaving the harbour with targets whenever artillery practice is to take place from any of the defence works in the under-mentioned areas. A red flag will also be hoisted fifteen

Charts 3670, 160, 2603, 2158a and b.

Chart 194.

minutes before the commencement of, and kept flying during the continuance of, firing from the work from which practice is to be made.

Limits of fire zone areas :—

- (a) Between a line drawn 022° from Ghallis tower and a line drawn 067° from Qalet Marku (Kalet Manu) tower.
- (b) Between a line drawn 360° from a position one cable westward of Maddalena tower and a line drawn 053° from St. George's point.
- (c) Between a line drawn 053° from Il Mercante and a line drawn 052° from a point on the coast 1·3 miles south-eastward of Ricasoli lighthouse.
- (d) Between a line drawn 052° from the above-mentioned point (c) and a line drawn 096° from Zonkor Point beacon.
- (e) Between a line drawn 096° from Zonnor Point beacon and a line drawn 135° from Delimara lighthouse.
- (f) Between a line drawn 135° from Delimara lighthouse and a line drawn 000° and 180° through the eastern extremity of Filfa.
- (g) Between a line drawn 000° and 180° through the eastern extremity of Filfa and a line drawn 261° from Nadur tower.
- (h) Between lines drawn 261° and 330° from Nadur tower.
- (j) Between a line drawn 330° from Nadur tower and a line drawn 022° from Ghallis tower.

Whenever and so long as a red flag is hoisted at any fort on the shore, between the lines described above, denoting the danger area, fishing is prohibited, and vessels are forbidden to pass through that area unless compelled to do so by stress of weather, in which case the master of the vessel may be called upon to prove that entering the area was unavoidable.

Any person infringing the above regulations will be liable to prosecution.

Vessels are warned that air, sea and land bombardment of Filfa may take place by day or at night. While such practice is taking place a red flag is displayed, by day, and a red light is exhibited, at night, at Torri tal Wied Zurrieq.

Charts 2063 and 2623.

NORTHERN SIDE OF MALTA.—Dangers.—Marfa (Mtarfa) point, the north-western extremity of Malta, lies about one mile southward of Irqika point. It is a low point backed by high sloping land, and is steep to on its southern side. From its northern side a bank, with depths of less than 3 fathoms (5^m5), on which lie several rocks, the highest of which is Skoll tal Marfa, 8 feet (2^m4) high, extends about 1½ cables northward. From Marfa point (*Lat.* 35° 59' N., *Long.* 14° 20' E.) the coast trends about 2 miles east-north-eastward to l-Ahrax point, and is low and rocky; it is indented by several small bays with beaches at their heads, and on the points between these bays and at the heads of the bays are the remains of old batteries.

Palazz iz-Zghir is an isolated building situated, close to the coast, about 4½ cables eastward of Marfa point, and about 3 cables farther eastward stands Palazz tal Marfa. This latter building is pink, crenellated and somewhat larger than Palazz iz-Zghir.

Torri l'Ahmar, standing on a ridge about three-quarters of a mile southward of Palazz tal Marfa, is pink and shows up well.

Charts 3670, 165, 2603, 2158a and b.

Charts 2063 and 2623.

Torri l'Abjat, 17 feet (5^m2) in height and prominent, surmounts a point about 2 cables south-westward of Ahrax point; *see* view facing page 398.

- 5 L-Ahrax point is low, and from it a spit, with depths of less than 5 fathoms (9^m1), extends about one cable north-north-westward. Palazz tal Marfa in line with the fall of the high cliffs above Ras il-Qammieh, *see* page 401, bearing 229°, leads about 1½ cables northward of the spit. *See* view on chart 2623.
- 10 From l-Ahrax point, the coast trends about three-quarters of a mile south-eastward to Dahlet ix-Xilip, and consists of high, broken cliffs, with rocks below them, especially near the latter point.

Dahlet ix-Xilip (ish Shillip) is a high bluff, surmounted by a conspicuous chapel and a statue close to the edge of the cliff.

- 15 *Chart 2063.*

Mellieha bay is entered between Dahlet ix-Xilip and Il-Blata l-Bajda, about 1½ miles south-eastward; there are sunken rocks and shoals within 6½ cables of the head of the bay, within 2 cables of its north-western shore, and within 2 cables of the shore close westward of

- 20 Il-Blata l-Bajda. Tunny nets, *see* page 27, are laid, during the season, within half a mile southward of Dahlet ix-Xilip and within 3½ cables of a point, on the north-western shore of the bay, about 3½ cables south-westward of Dahlet ix-Xilip. The town of Mellieha (*Lat.* 35° 58' N., *Long.* 14° 22' E.), with its prominent church, stands
- 25 on high ground southward of the head of the bay.

Charts 2063, 2623.

Off-lying bank.—Secca l-Bajda consists of a number of patches, with depths of less than 10 fathoms (18^m3), which lie between one and 2 miles north-eastward and eastward of Dahlet ix-Xilip. Depths of

- 30 35 feet (10^m7) lie about one mile north-eastward and 2 miles east-north-eastward, respectively, of Dahlet ix-Xilip. This shoal should be avoided by vessels of deep draught. Target buoys are sometimes laid out on this bank, *see* page 388. Mosta dome, *see* page 392, in line with Torri Qawra, *see* page 391, bearing 179°, leads half a mile
- 35 eastward of the eastern 35-foot (10^m7) patch. Marfa point, bearing less than 252° and open northward of l-Ahrax point, leads 2 cables northward of the western 35-foot (10^m7) patch. Irqipa point, bearing 278° and just open northward of l-Ahrax point, leads 3 cables southward of the western 35-foot patch.

- 40 **Anchorages.**—With offshore winds, anchorage can be obtained off the coast between Marfa point and l-Ahrax point. There are depths of 6 fathoms (11^m0) within 3½ cables of this stretch of coast in places, and, the water being very clear, the bottom, of sand and weed, is easily visible in depths of 12 fathoms (21^m9); there are a few rocky
- 45 patches, and when anchoring care should be taken to avoid them.

Chart 2063.

- Mellieha bay affords good anchorage during offshore winds; vessels of deep draught should keep the statue of St. Paul, on Selmunett, *see* below, bearing more than 112° and open northward of the outermost
- 50 above-water rock on Ras il-Gri beg, a point nearly one mile west-north-westward of Il-Blata l-Bajda.

St. Paul's bay. — Beacon. — Lights. — Buoyage. — This bay is entered between Selmunett and Ras il-Qawra (Kaura), about one mile south-eastward.

Charts 194, 3670, 165, 2603, 2158a and b.

Chart 2063.

Selmuñett is an islet lying close inshore on the south-eastward of Il-Blata l-Bajda. It is in two parts joined by a low, narrow isthmus, named Issillat. On the summit of the western part, at an elevation of 130 feet (39^m6), stands a remarkable statue of St. Paul; *see* view facing page 399. A square beacon, painted black and white in horizontal bands, is situated on the southern shore of the eastern part of Selmuñett, about 3½ cables eastward of the statue. There is a landing place on the south-eastern side of the isthmus, about one cable westward of the beacon. The channel between the islet and the mainland is available for small craft with local knowledge only. A bank, with depths of less than 30 feet (9^m1), extends about one cable from the eastern end of Selmuñett. Ghallis tower, *see* page 392, bearing more than 128° and open north-eastward of Qawra tower, leads half a cable north-eastward of this bank. Tunny nets, *see* page 27, are laid, during the season, within one-quarter of a mile of Selmuñett.

Ras il-Qawra (Kaura) is a low point from which a spit, with a depth of 6 fathoms (11^m0) over its extremity, extends about half a mile east-north-eastward. Torri Qalet Marku, *see* page 392, in line with the eastern extreme of Fort Maddalena, bearing 154°, leads 1½ cables eastward of this spit.

Qawra tower, 42 feet (11^m8) in height, is a yellow watch-tower standing, at an elevation of 45 feet (13^m7), about one-quarter of a mile west-south-westward of Ras il-Qawra.

A spherical framework light-buoy, painted red and white in vertical stripes, and exhibiting a *white flashing* light *every second*, is periodically moored about 1½ cables north-westward of Qawra tower; close westward of the light-buoy lie two mooring buoys, about three-quarters of a cable apart, and southward of the mooring buoys are two spherical buoys, moored about 70 feet (21^m3) apart. This light-buoy, and the adjacent mooring and spherical buoys, are removed from their stations annually between the months of September and May.

Palazz Selmun is situated about one mile west-south-westward of the statue of St. Paul (*Lat.* 35° 57' N., *Long.* 14° 23' E.), on a hill 340 feet (103^m6) high.

Wardija (Uardja) tower, a large, white, square building, 78 feet (23^m8) in height, stands in the village of San Paul à Mare, about 1½ miles west-south-westward of Qawra tower. Behind the village Wardija hill rises to elevations of over 350 feet (106^m7).

A light is exhibited, at an elevation of 88 feet (26^m8), from a structure, 10 feet (3^m0) in height, situated on Wardija tower. In 1948, the light was reported to be unreliable.

A light is exhibited, at an elevation of 27 feet (8^m2), from an iron column, 21 feet (6^m4) in height, situated at the root of a small stone jetty, about 6 cables westward of Wardija tower. In 1947, this light was extinguished. The jetty extends submerged for about 15 feet (4^m6), and has depths of about 6 feet (1^m8) along either side.

St. Paul's shoal, with a depth of 6 fathoms (11^m0), lies near the middle of the bay, about 4 cables south-eastward of St. Paul's statue. The head of the bay is shoal, and a detached rocky patch, with a depth of 4 fathoms (7^m3), lies within three-quarters of a mile of it.

Anchorage.—Mooring buoy.—Anchorage, sheltered from offshore winds, can be obtained anywhere in St. Paul's bay in depths over 10 fathoms (18^m3). The holding ground is good, except on a rocky

Charts 194, 3670, 165, 2603, 2158a and b.

Chart 2063.

patch near the entrance, but in depths less than 10 fathoms (18^m3) care must be taken to select a sandy spot. Small vessels can obtain good sheltered anchorage, in a depth of about 8 fathoms (14^m6), off Qala

5 Mistra, on the north-western side of the bay, with St. Paul's statue in line with the extremity of Il-Mignuna point, close north-eastward of the cove, bearing 022°, and Wardija tower in line with Naxxar dome, *see below*, bearing about 137°; the depths in the cove itself are shoal. A mooring buoy lies in the approach to Qala Mistra.

- 10 **Coast.—Dangers.—Beacons.**—From Ras il-Qawra, the north-eastern coast of Malta trends about 4½ miles south-eastward to Sliema point. It is indented by numerous bays, suitable only for small craft with local knowledge, though landing can usually be effected in them. *See view facing page 398.*

- 15 Salini bay or Benuarrat is entered between Ras il-Qawra and Ras il Ghallis, about 3½ cables south-south-eastward. At the head of this bay are the government salt works. A 38-foot (11^m6) rocky patch lies off the entrance to this bay about half a mile eastward of Ras il-Qawra.

- Two beacons, about half a cable apart, stand on the southern side of
- 20 Ras il-Qawra. The eastern beacon is painted black and white in vertical stripes, and the western black and white in horizontal bands.

- Ghallis tower, white and 39 feet (11^m9) in height, stands, at an elevation of 53 feet (16^m2), on Ras il Ghallis. Ghallis rocks, 3 feet (0^m9) high, lie within 2 cables of the coast about 6½ cables south-
- 25 eastward of Ras il Ghallis. A steel, framework structure, 50 feet (15^m2) in height, and surmounted by a corner radar reflector, the top of which is elevated 75 feet (22^m9), stands on the north-eastern end of Ghallis rocks.

- Ras il-Qretjen (Kreiten), which rises to a hillock 78 feet (23^m8) high, lies about half a mile south-eastward of Ghallis rocks, and on its north-western and south-eastern sides lie two shallow bays, named, respectively, Qala San Marku and Qala Ta' Bahar-ic-Caghaq.

Torri Qalet Marku is pink and 38 feet (11^m6) in height. It stands on the summit of the hillock above Ras il-Qretjen.

- 35 Marku (Marco) shoal is a detached patch, with a depth of 4 fathoms (7^m3), situated about 4 cables eastward of Ras il-Qretjen. Maddalena tower, 40 feet (12^m2) in height and white, stands near the coast, at an elevation of 80 feet (24^m4), about 8 cables east-south-eastward of Il-Blata l-Bajda, the eastern entrance point of Qala Ta' Bahar-ic-
- 40 Caghaq. Ghargur, Maxxar, and Mosta domes are situated, respectively, 1½, 2 and 2½ miles south-westward of Maddalena tower. Fort Maddalena stands, at an elevation of 430 feet (131^m1), about 6½ cables south-westward of the tower. The tower of St. Patrick's hospital, about 3½ cables southward of Maddalena tower, surmounts a large
- 45 yellow stone building and is conspicuous.

Charts 2063, 2628.

Maddalena point lies about 4 cables eastward of Maddalena tower. A bank, with depths of less than 5 fathoms (9^m1), extends about 2 cables north-eastward of the point.

- 50 St. George's point lies on the northern side of St. George's bay about 7 cables south-eastward of Maddalena point, and on it stands St. George's tower (*Lat. 35° 55' N., Long. 14° 29' E.*). A radio mast stands about 4 cables south-westward of the tower.

St. George's shoals lie on a rocky spit extending about 6½ cables

Charts 194, 3670, 165, 2603, 2158a and b.

Charts 2063, 2628.

north-north-eastward from the coast in the vicinity of St. George's point. On this spit lie Outer, Middle and Inner St. George's rocks, with depths, respectively, of 5, $4\frac{1}{2}$ and 3 fathoms (9^m1, 7^m8, and 5^m5). Torri Qalet Marku in line with Palazz Selmun, bearing 282°, leads about 1½ cables northward of Outer St. George's rock, and St. Paul's church spire in line with the eastern steeple of St. John's cathedral in Valetta, bearing 168°, leads about 1½ cables eastward of it.

Il Mercante or Spinola rock, with depths of less than 6 feet (1^m8), lies near the extremity of a spit, extending north-eastward from the coast, about 4 cables south-eastward of St. George's tower.

St. Julian point, the south-eastern entrance point of St. Julian's bay, lies about three-quarters of a mile south-south-eastward of St. George's tower.

A light is exhibited, at an elevation of 78 feet (23^m8), from a tower situated about half a cable southward of St. Julian point.

Caution.—Anchorage.—Buoy.—Caution must be exercised when off the coast between St. Paul's bay and Valetta harbours on account of Ghallis Rocks air firing and Pembroke rifle range areas, the limits of the danger zones of which are indicated by pecked lines on chart 2063. A red flag will be displayed either at Torri Qalet Marku or Ghallis tower when firing is taking place on the Ghallis Rocks range and a similar warning will be given from Maddalena tower or St. George's tower when firing is taking place on Pembroke range. Nadur church, Gozo, bearing less than 298° and open north-eastward of Ras tal Ghemieri, leads north-eastward of both danger zones. Marks, consisting of a red circle and a red square, are situated near Maddalena tower and St. George's tower; these marks in line bearing 180° and 233°, respectively, mark the western and south-eastern limits of Pembroke range.

Anchorage is prohibited in an area, the limits of which are indicated by pecked lines on the charts, off St. George's and St. Julian bays, owing to the existence of submarine telegraph cables. See page 19.

A red conical buoy, marked "Congreve," is moored about one mile north-eastward of St. Julian point.

Anchoring and fishing is prohibited in an area, the limits of which are indicated by pecked lines on the charts, between St. George's point and Ras il Jebel (page 397).

Anchorage berths for men-of-war in the approaches to Valetta harbours are indicated by letters and numbers on the charts.

Chart 974.

VALETTA HARBOURS.—General remarks.—These harbours, on the north-western and south-eastern sides, respectively, of the peninsula on which stands the city of Valetta, are named Marsamxett, or Quarantine harbour, and Grand harbour. Each have creeks on their sides farthest from the city, those in Marsamxett being named Sliema creek, Lazaretto creek, and Msida creek, and at the head of the harbour is Pieta creek. On the south-eastern side of Grand harbour are Bigli bay, with Rnella bay and Kalkara creek leading out of it, Dockyard creek, and French creek, and the head of the harbour is known as The Marsa (*Lat. 35° 54' N., Long. 14° 31' E.*).

Special regulations are in force in both harbours, see page 481.

Vessels in quarantine are permitted, in certain cases, to enter

Charts 194, 3670, 165, 1800, 2603, 2158a and b.

Chart 974.

Marsamxett for the purpose of taking in coal or provisions. Vessels not permitted to enter either of the harbours are allowed to communicate, in quarantine, with the islands of Kemmuna and Kemmunett, 5 under such restrictions as the Collector of Customs may impose.

Pilot boats fly a red and white horizontal flag, and have the words *Pilot boat* painted on either bow; in fine weather the pilots board vessels outside the harbours, but during north-easterly gales they are unable to do so.

10 Whenever weather conditions prevent pilot boats proceeding outside the Grand harbour to meet incoming vessels, the following signals will be shown from the Palace Tower signal station and from Fort St. Angelo (*see* page 396):—

By day: Two black balls, disposed vertically.

15 *At night*: Three red lights, disposed vertically.

So long as these signals are shown, masters of vessels must exercise their own discretion as to whether they should enter the Grand harbour or not. On entering the Grand harbour, incoming vessels will be met by the pilot boat inside the harbour.

20 **Marsamxett.—Lights.—Buoyage.**—This harbour is entered between Tigne point, about 6 cables south-eastward of Sliema point, *see* charts 2063 and 2628, and the shore westward of St. Elmo point, and is there about $1\frac{1}{2}$ cables wide. Within the harbour and its creeks are numerous mooring buoys and submarine telegraph cables, *see* 25 page 19, of which the moorings of the former and the routes of the latter are indicated on the chart; the landing places of some of the cables are marked by notice boards.

Dragut shoal, with depths of 5 fathoms (9^m1), lies about $3\frac{1}{2}$ cables north-eastward of Tigne point, and should be avoided during a Gregale, 30 *see* page 39, or when a heavy sea is running. The flagstaff on Fort St. Angelo, *see* page 396, in line with the eastern end of the bridge between St. Elmo point and the breakwater, *see* page 395, bearing 198° , leads about $1\frac{1}{2}$ cables eastward of the shoal.

A spherical light-buoy, painted red and exhibiting a *white flashing* 35 *light every second*, marks the shoal bank extending about three-quarters of a cable eastward from the coast between Tigne point and Dragut point, about half a cable northward.

A flagstaff stands close southward of Fort Tigne; a clock-tower is situated about $1\frac{1}{2}$ cables north-westward of the flagstaff. A red spar 40 buoy is moored on the northern side of the harbour entrance, about half a cable south-eastward of Fort Tigne flagstaff.

Manoel island, on which are situated Fort Manoel and the Lazaretto, separates Sliema creek from Lazaretto creek, and is joined to the mainland by a shoal flat spanned by a bridge.

45 A pier, with slipways north-westward of it, is situated about a cable north-westward of the eastern extremity of Manoel island. A group of six slipways is situated at Phoenicia hard, on the northern shore of the island, between two jetties, the western of which has a crane at its head (*Lat.* $35^\circ 54' N.$, *Long.* $14^\circ 30' E.$).

50 A small conical light-buoy, painted red and exhibiting a *white flashing light every ten seconds*, marks the extremity of a spit that extends about one-quarter of a cable from the eastern extremity of Manoel island.

A small conical light-buoy, painted red and exhibiting a *white*

Charts 2063, 2628, 194, 3670, 165, 1800, 2603, 2158a and b.

Chart 974.

flashing light, every five seconds, marks the limit of the deep water on the north-eastern side of Sliema creek near the entrance.

Two small conical light-buoys, painted red and each exhibiting a *red flashing light every five seconds*, and a red spar buoy mark the edge of the shoal water on the southern side of Sliema creek.

A small conical light-buoy, painted red and exhibiting a *red flashing light, every five seconds*, marks the edge of the shoal water on the southern side of Marsamxett opposite the entrance to Lazaretto creek.

A small conical light-buoy, painted red and exhibiting a *red flashing light every five seconds*, marks the edge of the shoal water south-eastward of Msida point, which separates Lazaretto and Msida creeks. A shoal, with depths of from 4 to $4\frac{1}{2}$ fathoms (7^m3 to 8^m7), extends from Msida point to a position about half a cable southward of the buoy.

Prohibited anchorage.—Anchorage is prohibited in an area, the limits of which are indicated by pecked lines on the chart, south-south-eastward of the southern side of Manoel island, on account of submarine cables; *see* page 19.

Grand harbour. — Lights. — Buoyage. — Grand harbour (*Lat. $35^\circ 54'$ N., Long. $14^\circ 31'$ E.*) is entered between two breakwaters extending one from St. Elmo point and the other from Ricasoli point, about $2\frac{1}{2}$ cables south-south-eastward. In it are numerous mooring buoys, and submarine cables, *see* page 19; the routes of the latter are indicated by wavy lines on the chart.

The breakwater which extends about 2 cables eastward from St. Elmo point is connected with the point by a bridge, with a clearance of 27 feet (8^m3) above mean sea level. The depths in the passage under the bridge are less than 4 fathoms (7^m3).

A light is exhibited, at an elevation of 52 feet (15^m8), from a white circular tower, with a red horizontal band on its eastern side, situated on the head of St. Elmo breakwater.

On Ricasoli point, from which a breakwater extends about half a cable north-westward, stands Fort Ricasoli. Three prominent radio masts (*see* chart 2628) stand close south-eastward of Fort Ricasoli. The south-eastern radio mast, from which *red* lights are exhibited, is the highest of the three and attains an elevation of 464 feet (141^m4).

A light is exhibited, at an elevation of 40 feet (12^m2), from a white circular stone tower, 30 feet (9^m1) in height, with red horizontal bands on its eastern side, situated on the head of Ricasoli Point breakwater.

L'Imgherbeb point, about $3\frac{1}{2}$ cables south-south-westward of St Elmo point, is fringed by a shoal bank, which is marked by a conical light-buoy, painted red and exhibiting a *white flashing light every ten seconds*.

No. 11 mooring buoy, situated in the centre of the harbour about $2\frac{1}{2}$ cables south-westward of Ricasoli point, is specially equipped for the use of large merchant vessels (*see* Note 2 on chart).

The Naval hospital is situated on a headland on the south-eastern side of Bighi bay, which separates Rnella bay from Kalkara creek. The landing place is in Kalkara creek.

The hospital flagstaff is situated about midway between Hospital point and Bighi point, the north-eastern and south-western extremities, respectively, of the above-mentioned headland.

For dangerous area, *see* page 396.

Charts 2063, 2628, 194, 3670, 165, 1800, 2603, 2158a and b.

Chart 974.

St. Angelo point separates Bighi bay from Dockyard creek ; on it stands Fort St. Angelo, in which there is a flagstaff.

A can light-buoy, painted red and exhibiting a *red flashing* light *every five seconds*, is moored about half a cable north-westward of Fort St. Angelo.

Senglea Isola or point separates Dockyard creek from French creek, and on it stands a fort, on the north-western angle of which there is a prominent watch tower. The shoal bank, which fringes this point, is marked by two can light-buoys, each painted red and exhibiting a *red flashing* light, *every five seconds*.

Dockyard creek and French creek are reserved for the use of Government vessels. Anchorage is prohibited in both these creeks. Dock No. 1 is at the head of Dockyard creek, and Docks Nos. 2, 3, 4 and 5 are in French creek ; *see* page 486.

Custom House steps, on the north-western side of the harbour near Lascaris bastion, lie about $3\frac{1}{4}$ cables south-westward of L'Imgherbeb point. About $4\frac{1}{2}$ cables farther south-westward is the Gun wharf ; the edge of the shoal bank off this wharf is marked by a red spar buoy. The depths above the Gun wharf are less than 6 fathoms (11^m0).

Anchorage is prohibited, owing to the presence of submarine cables, in an area, the limits of which are indicated by pecked lines on the chart, between Dockyard creek and Custom House steps.

Ras Hanzir lies on the south-eastern side of the harbour about half a mile south-westward of Isola point, and the edge of the shoal bank off it is marked by a spar buoy, painted black and white in horizontal bands.

Two lights, disposed vertically, are exhibited, at elevations of 15 and 17 feet (4^m6 and 5^m2), from an iron beacon situated about 10 yards (9^m1) north-westward of Ras Hanzir.

A floating dock is moored on the north-eastern side of Ras Hanzir, and south-eastward of the point are Corradino heights.

A visible wreck lay, in 1950, south-westward of Ras Hanzir.

On the north-western side of The Marsa an entrance about 75 feet (22^m9) wide, spanned by a bridge, provides access to the North-West basin in which there are depths of from $1\frac{1}{4}$ to $1\frac{3}{4}$ fathoms (2^m3 to 3^m2) ; there is a slipway at the north-western corner of this small basin.

Depths in the south-western extension of The Marsa decrease gradually from about 4 fathoms (7^m3), at its entrance, to about $1\frac{1}{4}$ fathoms (2^m3) near its head ; a tall chimney stands about $1\frac{1}{2}$ cables north-westward of the creek.

Two slipways are situated in the south-western extension of The Marsa, one at its head and the other at the south-eastern corner ; Hard No. 1, close northward of the latter, is usually reserved for the berthing of naval craft.

Directions.—A large vessel approaching the entrance of Grand harbour should steer about 237°, and her speed on passing the breakwaters should not be greater than is necessary for keeping the vessel under command, but it is most undesirable to stop engines before the ship is on her course up the harbour. A vessel should be on its guard against being unable to check her swing to port after passing Ricasoli Point breakwater or they may endanger vessels moored in Bighi bay (Lat. 35° 54' N., Long. 14° 31' E.).

Dangerous areas.—An area, which is dangerous on account of

Charts, 2628, 194, 3670, 165, 1800, 2603, 2158a and b.

Chart 974.

wrecks, is indicated by pecked lines on the chart on the south-western side of Kalkara creek; the north-eastern limit of this area is marked by spherical buoys, painted red and white. Another area, dangerous for the same reason, is indicated by pecked lines on the chart on the north-eastern side of Kalkara creek; a spherical buoy, painted red and white, is moored on the southern side of this area. 5

City.—Port facilities.—Communications.—Valetta occupies a peninsula forming a ridge about 110 feet (33^m5) high, and between the two lines of fortifications on its landward side is the suburb of 10 Floriana. The cathedral of St. John, with its two turrets, surmounts the ridge in the centre of the city, and the church of St. Paul, with its tall spire, is situated about 2 cables northward of it. In addition to the Naval and Military hospitals, there is one for seamen in Floriana.

Provisions and stores are abundant. Water is sent off in tank 15 vessels; drinking water should be boiled before use.

Large stocks of coal and fuel oil are maintained.

Repairs of all kinds can be effected. Numerous tugs and a large number of lighters are available. There are several cranes in the port, the lifting capacity of the largest being 160 tons. For particulars of 20 the largest dry dock, *see* page 486.

The naval signal station is situated on Lascaris bastion immediately north-eastward of the customs house. The storm, local or traffic signals given on page 12 and in Appendix I are displayed from the Palace Tower signal station and from Fort St. Angelo. There is 25 a Lloyds signal station on the Palace tower.

There is regular steamer communication with Great Britain and Northern Europe, and with the principal Mediterranean ports. Local steamers ply between Valetta and Syracuse and between Valetta 30 and Gozo.

There is regular air communication between Malta and Syracuse.

For radio communication, *see* page 21.

Climatic table.—*See* page 58.

Chart 2628.

EASTERN END OF MALTA.—Dangers.—Buoyage.—From 35 Ricasoli point, the coast trends about 3 miles south-eastward to Zonkor point (*Lat.* 35° 52' N., *Long.* 14° 35' E.), and is backed by hills 223 feet (68^m0) high. *See* view facing page 398.

A green conical buoy, surmounted by a cylinder, is moored about 2 cables east-south-eastward of Ricasoli point; in 1946, entry into 40 the cove immediately southward of the position of this buoy was dangerous on account of wrecks.

The flagstaff at the Verdala palace, on the south-western side of the island, in line with the south-eastern radio mast close south-eastward of Fort Ricasoli, *see* page 395, bears 253° 48'; this transit is convenient 45 when swinging ship for the correction of compasses, *see* chart 194.

Kalanca tal Patriet lies about 6 cables south-eastward of Ricasoli point; near it there is a rifle range. A spherical light-buoy, painted red, marked "Fairway," and exhibiting a *white flashing* light *every 50 four seconds*, is moored about three-quarters of a mile east-north-eastward of the head of St. Elmo breakwater. A red flag is displayed at the flagstaff on the range, when firing is in progress.

Ras il Jebel lies about 8 cables south-eastward of the head of Kalanca

Charts 194, 3670, 165, 1800, 2603, 2158a and b.

Chart 2628.

tal Patriet, and off the coast south-eastward of it is a measured distance of 6,080 feet (1,853^m2), marked by beacons ; the course for running the distance is 129° or 309°, and each pair of beacons is in line when bearing
 5 219°. The front beacons are surmounted by diamonds, and the rear beacons by globes ; on the walls of fields between the south-eastern pair of beacons are two white stripes which are in line with the beacons when the latter are in transit.

Della larga Forca, a detached bank, with a depth of 5 fathoms (9^m1),
 10 lies within 4½ cables north-eastward of the front one of the south-eastern pair of measured distance beacons ; vessels of deep draught should pass outside this bank.

Zonkor point is low, and about one cable within it stands a stone beacon painted black and white in horizontal bands.

15 Secca Zonkor, with depths of less than 5 fathoms (9^m1), extends about 4 cables east-south-eastward from Zonkor point. There is a detached 4½-fathom (7^m8) patch situated about 1½ cables north-north-eastward of the extremity of Secca Zonkor.

Marsaskala is entered southward of Zonkor point, and the depths
 20 in it shoal suddenly to 3 fathoms (5^m5), a short distance within the entrance.

Zejtun, a town in which stands a prominent church, with a red dome, 295 feet (89^m9) high, is situated on high ground about 1½ miles west-south-westward of the head of Marsaskala.

25 Il Gzira lies, close off the southern entrance point of Marsaskala, about 3½ cables southward of Zonkor point. It is marked by a red iron beacon, surmounted by a cage, 17 feet (5^m2) in height. Fort St. Thomas, an old white castle with turrets at its four corners, stands, at an elevation of 53 feet (16^m2), about 2 cables westward of Il Gzira.

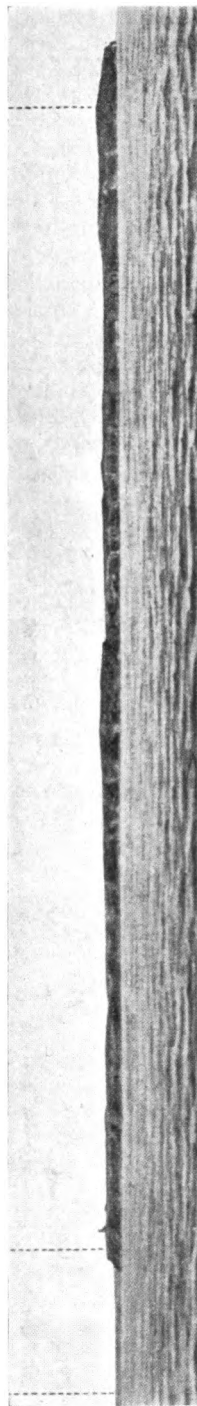
30 Ir Ramla ta San Tumas is situated at the head of a shallow bay which is entered between Il Gzira and Munxar point, about three-quarters of a mile south-south-westward. The bottom in this bay is sand and rocks covered with weed. A rock, with a depth of 8 feet (2^m4), lies in the middle of the bay about one-quarter of a mile north-
 35 westward of Munxar point.

Munxar point (*Lat.* 35° 51' N., *Long.* 14° 34' E.) is situated at the north-eastern end of some white cliffs, 145 feet (44^m2) high, and from it a rocky spit, with depths of less than 6 feet (1^m8), extends about 4 cables east-north-eastward.

40 Secca il Munxar, with a depth of 1½ fathoms (3^m2), lies about three-quarters of a mile east-north-eastward of Munxar point. Outer Munxar rock, a 5½-fathom (10^m1) patch, lies about 11 cables eastward of Munxar point. The depths in this vicinity are very uneven, and cause heavy seas during easterly winds ; the point should be given
 45 a wide berth. St. Elmo Breakwater lighthouse, bearing less than 303° and open north-eastward of the coast south-eastward of it, leads 7 cables north-eastward of Outer Munxar rock and Secca il Munxar, but does not clear Della larga Forca.

Munxar pass lies between Secca il Munxar and the spit extending
 50 from Munxar point ; the depths in it are uneven, but not less than 4 fathoms (7^m3), and the bottom is rocky. Zonkor Point beacon in line with Il Gzira beacon, bearing 333°, or Delimara Point lighthouse, *see* below, bearing 211° and just open of Xirop (Shirob) il-Ghagin, leads through Munxar pass.

Charts 194, 3670, 165, 1800, 2603, 2158a and b.



Capo Grecale
lighthouse, bearing
210°, 8 miles.

Monte
Albero Sole.

Isola di Lampedusa from north-eastward.
(Original dated 1936.)

Palazzo
Selmun.

Torri
l'Abbat.

Nadur church,
bearing 270°, 18 miles.



Malla.

Kemmuna.

Gozo.

Gozo from eastward, with Kemmuna and the north-eastern coast of Malta.

Zejjun
church,
bearing 210°, Zabbar
12½ miles. church.

Mdina
cathedral.



Delimara
Point lighthouse.

Radio masts
(three in 1947).

Chareur
church.

South-eastern part of Malta from north-eastward.
(Originals dated 1932.)



St. Paul's statue.
(Original dated 1947.)



Punta Bassana. *Monte Falcone.*
Isola Marettimo from east-north-eastward.



Punta Faraglione. *Punta Sottile.*
Isola Favignana from north-westward.



Lighthouse, bearing 022°.
Isolotto Formica from southward.
(Originals dated 1938.)

Chart 2628.

Xirop il-Ghagin, half a mile southward of Munxar point, is low.

Il-Hofra l'Kbira (Cala ta Lihfar) and Il-Hofra z-Zghira (Xghajra) are coves situated close southward of Xirop il-Ghagin, with high white cliffs at their heads. From Il-Qali (Ponta ta Tumbrell), the southern entrance point of Il-Hofra z-Zghira, the coast trends about one mile southward to Delimara point, and is cliffy and irregular. 5

Targets.—Buoyage.—Caution.—A yellow raft, surmounted by a staff and black ball, for the use of aircraft, is moored about 6 cables south-south-eastward of Xirop il-Ghagin. 10

A target, consisting of two can buoys one cable apart, connected by a cable submerged to a depth of 20 feet (6^m1), is moored about 11 cables south-eastward of Xirop il-Ghagin; an area dangerous to navigation exists for a distance of about 3 miles seaward of this target.

Marsaxlokk. — Lights. — Light-buoy. — This harbour, *see* view on chart 2628, is entered between Delimara point and Binghisa point, about 9 cables west-south-westward. 15

Delimara point ends in a cliff, 50 feet (15^m2) high, and on its extremity a white square tower, 35 feet (10^m7) in height. Close southward of the point is Il Taktigha ta Marsaxlokk, an islet 13 feet (4^m0) high. 20

A light is exhibited, at an elevation of 151 feet (46^m0), from a yellow sandstone tower, 80 feet (24^m4) in height, about 1½ cables north-north-westward of the tower on Delimara point; a beacon stands about 1½ cables eastward of the lighthouse.

On the eastern side of the bay, for a little more than one-quarter of a mile northward of Delimara point, the shore consists of a bold yellow cliff, from 70 to 120 feet (21^m3 to 36^m6) high; thence it becomes less precipitous, until about half a mile farther northward it is faced with a high white cliff, named Il Hotba tal Bies. 25

Fort Tas Silg (ta Silc) stands on a hill 223 feet (68^m0) high, about 3½ cables northward of Il Hotba tal Bies. 30

Binghisa point and the western shore of the bay are low, but are backed by hills. The ruins of several batteries and forts stand on this side of the bay, which is indented by Kalafrana and Pretty bay.

Kalafrana, in which there is a torpedo depôt, is shoal, its head is foul, and it is available for small craft only. A tower stands on the eastern side of this cove, and a conspicuous water-tower on its western side. A short breakwater extends from the eastern side of the cove, and the ruins of a pier extend north-north-westward from the western entrance point (*Lat.* 35° 49' N., *Long.* 14° 32' E.). A small concrete jetty at the depôt on the western side of the cove has depths of 12 feet (3^m7) alongside, but care must be taken when approaching or leaving it, for the depth shoals very rapidly southward of it. 40

A can light-buoy, painted green and exhibiting a *green flashing light every three seconds*, marks the extremity of the ruined pier. 45

Two radio masts, from which lights are exhibited at elevations, respectively, of 175 and 260 feet (53^m3 and 79^m3), are situated about 3½ cables westward of the depôt at Kalafrana.

Pretty bay is entered on the southern side of a low promontory; there is a landing place for boats drawing up to 4 feet (1^m3) at the police station in Birzebbuga, on the northern side of the bay. On the promontory is a prominent white chimney, and near it is a pier extending south-south-eastward, with a depth of 3 fathoms (5^m5) at its head. 50

Fort St. Lucian, a large conspicuous square building, with turrets at

Charts 194, 3670, 165, 1800, 2603, 2158a and b.

Chart 2628.

its corners, surmounts a promontory at the head of Marsaxlokk which is faced with white cliffs from 50 to 60 feet (15^m2 to 18^m3) high.

Two lights are occasionally exhibited, at elevations of 119 and 125 feet (36^m3 and 38^m1), from an iron structure, 12 feet (3^m7) in height, situated in Fort St. Lucian.

A light is exhibited, at an elevation of 10 feet (3^m0), from an iron beacon, 15 feet (4^m6) in height, situated on Hajra rock, *see below*, about 2 cables east-south-eastward of Fort St. Lucian.

10 Qala Ta' San Gorg is entered close westward of the promontory on which stands Fort St. Lucian. On the eastern side of the promontory lies a shallow inlet, at the head of which stands the village of Marsaxlokk, in which there are two small churches and several noticeable buildings.

The Capucin convent is a large, dark building, with a conspicuous 15 white house about 2½ cables west-south-westward of it, standing on a ridge about 8½ cables north-north-westward of Fort St. Lucian.

Ghaxaq, situated on a ridge about three-quarters of a mile south-westward of Zejtun, *see page 398*, is a town in which there is a church with a dome and two spires. Half a mile farther westward stands an 20 old, round signal tower, 55 feet (16^m8) in height, situated at the eastern end of the village of Gudja; the church in Gudja has a dome and two spires. About one-quarter of a mile south-eastward of Zejtun church is the low, red dome of San Gregorio church.

Dangers.—Buoyage.—Foul ground extends about half a cable 25 southward from Il Taktigha ta Marsaxlokk.

Binghisa reef, with a depth of 3 fathoms (5^m5), lies near the extremity of a spit, with depths of less than 10 fathoms (18^m3), that extends about one mile south-eastward from Binghisa point. The reef affords some protection to Marsaxlokk during southerly winds, and the sea 30 breaks heavily on it during onshore winds. Binghisa patch, with a depth of 3 fathoms (5^m5), lies on the spit about 3 cables southward of Binghisa point. The Capucin convent in line with Fort St. Lucian, bearing 335°, and Zejtun church well open eastward of them, leads close eastward of the extremity of the spit; *see view A on chart 2628*. 35 Torri tal Wied Zurrieq, *see page 403 and chart 2629*, bearing more than 287° and open southward of Ras il-Bajtar, leads 3½ cables southward of Binghisa reef.

A shoal, with depths of less than 5 fathoms (9^m1), extends about 2 cables north-eastward from the eastern entrance point of Kalafrana 40 (*Lat. 35° 49' N., Long. 14° 32' E.*).

Ellis rock, with a depth of 3 fathoms (5^m5), lies about 1½ cables south-eastward of the south-eastern extremity of the promontory between Pretty bay and Qala Ta' San Gorg. It is marked by a red spar buoy on its south-western side. Two mooring buoys lie off the 45 pier extending from the promontory.

Hajra rock, 2 feet (0^m6) high, lies on a shoal bank that extends about one-quarter of a mile south-eastward from the promontory on which stands Fort St. Lucian.

A mooring buoy, exhibiting a *green flashing light every three seconds*, 50 lies close south-westward of a stranded wreck, lying on its side, situated about 4 cables south-westward of Hajra Rock light-structure; another mooring buoy, exhibiting a *red flashing light every three seconds*, lies less than a cable northward of the wreck. Three mooring buoys lie eastward of it.

Charts 194, 3670, 165, 1800, 2603, 2158a and b.

Chart 2628.

An area of foul ground lies about 6 cables north-north-westward of Delimara Point lighthouse. This foul area is marked by a conical light-buoy, painted green and exhibiting a *green flashing light every three seconds*; and by three green spherical buoys. 5

Torpedo range.—**Caution.**—A torpedo range, the centre line and sides of which are marked by pairs of beacons on the western side of Marsaxlokk, is established in the entrance of the harbour, and is indicated on the chart by pecked lines.

When required, two pairs of mooring buoys, painted red and white in vertical stripes, are laid on the centre line of the range, about 5 and $7\frac{1}{2}$ cables, respectively, from the pier head. The pair farthest from the pier head exhibit *white flashing lights every six seconds*.

When practice is in progress, a red flag is displayed on the targets and from the Torpedo Dépôt flagstaff. A vessel wishing to enter or leave Marsaxlokk, while practice is in progress, should sound her siren or whistle, and no attempt should be made to enter or leave until the red flags have been dipped (*Lat. $35^{\circ} 49' N.$, Long. $14^{\circ} 33' E.$*). 15

Anchorage.—**Directions.**—**Caution.**—Marsaxlokk affords safe anchorage, except during southerly winds, and these seldom blow home. The bottom is good holding ground of fine sand and mud between hard patches covered with weed. Small vessels usually anchor off the eastern shore, with Fort St. Lucian bearing about 283° . 20

A vessel bound to Marsaxlokk from north-eastward, by day, may round Delimara point at any convenient distance; but a vessel from southward or westward should pay attention to the clearing marks for Binghisa reef. At night, Delimara light should be kept bearing less than 356° until Hajra Rock light bears 340° .

A southerly set has often been observed off the eastern end of the island; during northerly winds its rate increased, and on occasions it has been experienced as far off as Hurd bank, *see page 384*. 30

About one mile off the entrance of Marsaxlokk, a very strong current sometimes sets north-eastward; it is caused, apparently, by south-easterly winds lasting several days, and it has ceased after two days of westerly winds. 35

*Chart 2063.***WESTERN AND SOUTHERN SIDES OF MALTA.—Dangers.**

—**Buoyage.**—Ic Cirkewwa (Cirkewwa) is a small bay, with a sandy bottom, on the southern side of Marfa point, *see page 389*. 40

Ras il-Qammieh (Kammieh), about one mile south-south-westward of Marfa point, is a steep point strewn with boulders and rising to a ridge 410 feet (125^m) high, with cliffs on either side of it. Foul ground extends about 3 cables westward from the point. The north-western extremity of Skoll tal Marfa in line with the south-eastern extreme of Kemmuna, bearing about 045° , leads about one-quarter of a mile north-westward off this foul ground. Tunny nets, *see page 27*, are laid, during the season, northward from Ras il-Qammieh. 45

Chart 2063, plan of Ras in Nieshfa bay.

Ras in Niexfa (Nieshfa) bay is entered between Ras il-Qammieh and Ras in Niexfa (Nieshfa), three-quarters of a mile south-eastward. The northern shore is bold and steep-to; the eastern shore is fringed, in places, with boulders lying close inshore. Foul ground, near the extremity of which lies a rock with a depth of $3\frac{1}{2}$ fathoms (6^m), extends 50

Charts 194, 3670, 165, 1800, 2603, 2158a and b.

Chart 2063, plan of Ras in Nieshfa bay.

one cable westward from Ras in Niexfa (*Lat. 35° 58' N., Long. 14° 20' E.*). Four beacons, painted red and white in horizontal bands, surmount the cliffs forming the shores of the bay, and a fifth stands on
5 the eastern end of the cliffs, a short distance northward of the northernmost of the four.

Chart 2063.

Il Prajjet (Praiiet), a rocky cove on the southern side of Ras in Niexfa, is the only place available for landing between Ras il-Qammieh
10 and Ras il Wahx, *see* below; boats entering the cove should keep close to the cliff on its southern side, for there are many sunken rocks under Ras in Niexfa.

Ras il Wahx (Wahsh) is similar to Ras il-Qammieh, and lies about 1½ miles south-south-westward of Ras in Niexfa. The western part of
15 Kemmunett bearing more than 001°, and open westward of the rocks off Ras il-Qammieh, leads 3½ cables westward of the edge of the foul ground off Ras il Wahx. There is a beacon on the south-western extremity of Ras il Wahx. Tunny nets, *see* page 27, are laid out, during the season, northward from Ras il Wahx.

20 Ghajn Tuffieha and Gnejna bay are entered between Ras il Wahx and Ras il Pellegrin, about one mile southward, and are separated by a remarkable rocky promontory, named Ras il-Qarraba (Karraba). At the head of each of these coves stands a watch-tower, named, respectively, Torri ta Ghajn Tuffieha and Torri ta Lippia.

25 Gnejna bay has a beach at its head on which landing can be effected, but the cove is too small to afford anchorage to any but small craft.

Ras il Pellegrin, the north-western extremity of Sicca tal Imjieles, is fringed with rocks, some of which are awash, extending about one cable offshore. Small craft entering Gnejna bay should keep
30 a solitary house at the head of the cove bearing more than 120°, and open north-eastward of the north-eastern extreme of Sicca tal Imjieles, to clear these rocks.

Fomm ir Rih is entered between Ras il Pellegrin and Ras ir Raheb, about one mile south-south-westward. Its southern side is faced with
35 a steep-to perpendicular cliff, from 120 to 170 feet (36^m6 to 51^m8) high. Its north-eastern side is fringed with boulders and sunken rocks that have fallen from the cliffs above, and on this side are two pyramidal beacons, painted black and white in horizontal bands, but they are not easily distinguished at a distance.

40 Ras ir Raheb (*Lat. 35° 54' N., Long. 14° 20' E.*) is steep-to and precipitous; on it stands a beacon, similar to those on the north-eastern side of Fomm ir Rih.

Anchorages.—Anchorage can be obtained in Ic Cirkewwa.

Anchorage can be obtained by small vessels, in a depth of about
45 6 fathoms (11^m0), in the middle of Ghajn Tuffieha.

Anchorage, sheltered from easterly winds, can be obtained in Fomm ir Rih.

Chart 194.

Coast.—Dangers.—From Ras ir Raheb, a continuous wall of high,
50 precipitous, steep-to cliffs trends about 6 miles south-eastward to Ix-Xaqqa (Cala is Sabia), and above these cliffs is the highest part of the island, which attains an elevation of 866 feet (264^m0); at the foot of the cliffs are numerous caves or grottoes.

Ras el Qaws (Kaus) lies about 1½ miles south-south-eastward of Ras ir

Charts 3670, 165, 2603, 2158a and b.

Chart 194.

Raheb, and on the cliffs near Dingli, about $2\frac{1}{2}$ miles farther south-eastward, is a disused signal station. About half a mile east-north-eastward of the disused signal station stand the masts of a disused radio direction-finding station.

5

Chart 2629.

From Ix-Xaqqa the coast trends about 2 miles east-south-eastward to Torri tal Wied Zurrieq, and the cliffs between are of no great elevation, but the land rises steeply to summits of hills about one-quarter of a mile inland.

10

Hagra s-Sewda (Hazra is Seuda) is a small rock, 2 feet (0^m6) high, situated, close inshore, about $3\frac{1}{2}$ miles south-south-eastward of the southern entrance point of Ix-Xaqqa.

Ras il-Hamrija (Hamria) lies about one mile east-south-eastward of Hagra s-Sewda, and on the hillside above it stands Torri Hamrija, 15 yellow and 34 feet (10^m4) in height.

Hamrija bank extends about 6 cables from the coast between Hagra s-Sewda and Ras il-Hamrija. This bank has a rocky uneven bottom, with depths of from 3 to 10 fathoms (5^m5 to 18^m3). A rock, with a depth of 5 feet (1^m5), lies about one cable south-westward of Ras 20 il-Hamrija.

Torri tal Wied Zurrieq is a pink, square tower, 38 feet (11^m6) in height.

Ras il-Bajtar (Cap tal Beitar) lies one mile east-south-eastward of Torri tal Wied Zurrieq, and between the coast consists of high dark cliffs. 25 Negrit mill is a ruin standing on a hill, 473 feet (144^m2) high, three-quarters of a mile north-westward of Ras il-Bajtar.

From Ras il-Bajtar, the coast, which is clifty, trends about $3\frac{1}{4}$ miles eastward to Binghisa point, *see* page 399 and chart 2628, and are less broken, more precipitous, but lighter in colour than those farther west- 30 ward; in one place they attain an elevation of over 300 feet (91^m4).

A current sometimes sets along the south-western coast of Malta with fresh westerly or north-westerly winds; it may extend from half a mile to one mile offshore, and flows at a rate of from half a knot to one knot.

35

Off-lying islet.—Dangers.—Filfla is a rocky islet, 205 feet (62^m5) high, and surrounded by cliffs, lying about $2\frac{1}{2}$ miles south-westward of Ras il-Hamrija (*Lat. $35^\circ 47' N.$, Long. $14^\circ 25' E.$*).

Two rocks, respectively, 51 and 29 feet (15^m5 and 8^m8) high, lie close off the western end of the islet, and within one cable westward of 40 the western and lower rock is a small detached shoal on which is a rock awash. A small rock, 2 feet (0^m6) high, lies close off the eastern end of the islet.

Stork rock, with a depth of $3\frac{3}{4}$ fathoms (6^m9), lies about $3\frac{3}{4}$ cables southward of the islet, and between them are some shoal patches with 45 depths of 3 fathoms (5^m5).

Chart 3670.

Off-lying banks.—A bank, with a least depth of 38 fathoms (69^m8), lies about 30 miles north-eastward of the eastern extremity of Malta.

50

Medina bank, an extensive area with depths of less than 100 fathoms (182^m9), and a least depth of 74 fathoms (135^m3) near its north-western side, lies about 60 miles south-eastward of the south-eastern extremity of Malta.

Charts 165, 1800, 2603, 2158a and b.

CHAPTER X

ISOLE EGADI—SICILY, WESTERN AND
SOUTHERN SIDES*Chart 189.*

ISOLE EGADI.—General remarks.—Caution.—Isole Egadi (Ægædean islands), *see* view on chart 170, are situated off the western coast of Sicily, and consist of three principal islands, Marettimo, 5 Levanzo, and Favignana, together with some islets and rocks which, being near the Sicilian coast, are described with the latter.

The currents in the vicinity of the islands are mostly caused by the winds; in the channel between them and the coast of Sicily they are strong and set north-eastward and south-westward, the north-east- 10 going current predominating in summer.

Isola Marettimo.—Dangers.—Lights.—This island, the western-most of Isole Egadi, lies about 18 miles from the western coast of Sicily, and had, in 1950, about 1,500 inhabitants. In its north-western part Monte Falcone attains an elevation of 2,251 feet (686^m1), about 1½ miles 15 south-eastward of Punta Mugnone, the north-western extremity of the island. *See* view facing page 399.

Punta Bassana (*Lat.* 37° 57' N., *Long.* 12° 05' E.), the south-eastern extremity of the island, is steep and rugged.

Cala Marino and Cala Cretazzo are coves situated, respectively, on 20 the north-eastern and south-western sides of the peninsula, of which Punta Bassana is the extremity.

Secca Cretazzo, with a depth of 3½ fathoms (5^m9), lies 3½ cables offshore about 1½ miles westward of the western entrance point of Cala Cretazzo, and is usually marked by breakers; no vessel should attempt 25 to pass between it and the coast. The lighthouse on Punta Sottile, *see* page 407, open southward of Punta Bassana, with the latter bearing less than 093°, leads at least one cable southward of Secca Cretazzo.

Punta Libeccio is a low, narrow, rocky projection situated about 1½ miles north-westward of the western entrance point of Cala Cretazzo. 30 There is a landing place near this point.

A light is exhibited, at an elevation of 241 feet (73^m5), from an octagonal tower surmounting a two-storied dwelling, the whole painted white with two black, horizontal bands, inscribed *Pta Libeccio* in black and 80 feet (24^m4) in height, situated on the coast about 4 cables 35 south-eastward of Punta Libeccio. Close southward of the lighthouse stands a small rectangular building. *See* view facing page 412.

Charts 170, 165, 2158a and b.

Chart 189.

Cala Spalmatore is entered about one-quarter of a mile northward of Punta Libeccio.

Cala Bianca, which has high cliffy shores, is entered on the southern side of Punta Mugnone. 5

From Punta Mugnone, a bank, with depths of less than 5 fathoms (9^m1), extends about 4 cables west-south-westward.

Punta Troia, the north-eastern extremity of the island, lies about 1½ miles eastward of Punta Mugnone; it is the extremity of a small, rocky peninsula on which stands an old castle with some modern 10 buildings in it. Between the two points the coast is fringed with rocks, awash, and on the western side of Punta Troia is Scalo Maestro.

Cala Manione is entered close southward of Punta Troia.

Scoglio Cammello, close inshore at the southern end of Cala Manione, is prominent. It lies off a cave of the same name. 15

Marettimo, the only village on the island, is situated on Punta San Simone, about 1½ miles south-south-eastward of Punta Troia. At either end of the village a small masonry jetty projects.

A light (*Lat.* 37° 58' N., *Long.* 12° 04' E.) is exhibited, at an elevation of 30 feet (9^m1), from a concrete column, 23 feet (7^m0) in height, 20 situated on the head of the northern jetty.

A light is exhibited, at an elevation of 20 feet (6^m1), from a white, quadrangular masonry hut, 13 feet (4^m0) in height, situated on Punta San Simone.

Anchorage.—Cala Cretazzo affords good shelter from north- 25 easterly winds to small vessels, with local knowledge, in depths of about 8 fathoms (14^m6), sand and weed, good holding ground.

Cala Spalmatore affords good shelter from north-easterly winds and moderate protection from those from south-eastward, to small vessels with local knowledge, in a depth of about 11 fathoms (20^m1). 30

Cala Bianca affords shelter from north-easterly winds to small vessels with local knowledge, in a depth of about 16 fathoms (29^m3), good holding ground of sand and weed, about 1½ cables offshore.

Anchorage, sheltered from south-westerly winds, can be obtained by small vessels with local knowledge, off Scalo Maestro, in a depth of 35 10 fathoms (18^m3), about 1½ cables offshore; the bottom is rocky and the anchor should be buoyed.

Cala Manione affords good shelter from westerly and north-westerly winds, to small vessels with local knowledge, in depths of from 5½ to 8 fathoms (10^m1 to 14^m6), good holding ground of sand and weed, 40 about 1½ cables offshore.

Temporary anchorage can be obtained off the village of Marettimo, in depths of from 5½ to 6½ fathoms (10^m1 to 11^m9); the water is very clear, and care must be taken to select a sandy spot; a good position is with the light-structure on the northern jetty bearing 273°, distant 45 about 2½ cables, but the anchor should be buoyed.

Cala Marino affords good anchorage, sheltered from westerly and south-westerly winds, to small vessels with local knowledge, in a depth of about 8 fathoms (14^m6), sand and good holding ground.

During westerly gales, a heavy swell sets into both Cala Manione 50 and Cala Marino, and better shelter is then obtained about 2½ cables southward of the village of Marettimo, off a small chapel on the road to the cemetery.

Isola Levanzo.—**Light.**—This rugged island, which had about

Charts 170, 165, 1440, 2158a and b.

Chart 189.

250 inhabitants, in 1950, is 912 feet (278^m0) high, and lies about 12 miles eastward of Isola Marettimo. Except at its north-western and south-eastern ends, it is fringed with steep cliffs and it is generally barren, but there are a few places where the soil is cultivated.

Il Faraglione, a remarkable conical rock, is connected with the south-western extremity of the island by a small isthmus.

Cala Tramontana is entered about 1½ miles northward of Il Faraglione, and from its western entrance point, a bank, with depths of less than 3 fathoms (5^m5), extends a short distance offshore.

Capo Grosso (*Lat.* 38° 01' N., *Long.* 12° 20' E.), about 8 cables north-north-eastward of the western entrance point of Cala Tramontana, is the steep, rocky, northern extremity of the island.

A light is exhibited, at an elevation of 225 feet (68^m6), from a white, circular tower and dwelling, situated on Capo Grosso. Near the lighthouse there is a signal mast. *See view facing page 412.*

Punta l'Altarello, the south-eastern extremity of Isola Levanzo, lies about 2 miles south-south-eastward of Capo Grosso, and the coast between them is free from off-lying dangers. There is a low, four-sided tower on a hill, 262 feet (79^m9) high, about 3 cables westward of the point.

Cala Fredda, the shores of which are fringed with rocks, is entered about half a mile south-westward of Punta l'Altarello.

Cala Dogana lies close westward of Cala Fredda, and in it is a beach. At the head of the cove is a village, where there is a landing place.

Anchorages.—Cala Tramontana affords temporary anchorage, to vessels with local knowledge, with winds between east and south-west, in depths of from 11 to 16 fathoms (20^m1 to 29^m3).

Cala Fredda and Cala Dogana afford anchorage to small vessels, with local knowledge, during northerly winds; the bottom in both coves is sand and good holding ground.

Off-lying bank.—Secca dei Pesci, a detached bank with a depth of 12 fathoms (21^m9), lies about 5 miles north-westward of Capo Grosso.

Isola Favignana. — Dangers. — Lights. — Fog signal. — Signal station.—This island, the largest of the group, is situated with Punta Faraglione, its northern extremity, about 2 miles south-south-westward of Il Faraglione. In 1950, the population was about 5,000. A chain of hills, named Montagna Grossa, extends southward across the island from Punta Faraglione, and on its summit, at an elevation of 991 feet (302^m1), is Forte Santa Caterina, in which there is a signal station consisting of a turret painted black and white in chequers and having a signal mast. On either side of the hills, the island is low and cultivated. *See view facing page 399.*

Punta Faraglione, when seen at a distance from westward or eastward, appears as an islet, and the coast between it and Punta del Ferro, about 1½ miles south-westward, is fringed with rocks and shoals extending about 2 cables offshore.

Cala del Pozzo, about one mile south-westward of Punta Faraglione, is shallow.

Punta Sottile, the rocky, western extremity of the island, lies about 6½ cables south-south-westward of Punta del Ferro, and the coast between is fringed with rocks and shoals extending about 3 cables offshore. This point is very low and white, and from it a bank, with depths of less than one fathom (1^m8), extends about 4 cables south-westward.

Charts 170, 165, 1440, 2158a and b.

Chart 189.

A light (*Lat.* $37^{\circ} 56' N.$, *Long.* $12^{\circ} 16' E.$) is exhibited, at an elevation of 143 feet (43^m6), from a white, circular tower and dwelling, 126 feet (38^m4) in height, situated on Punta Sottile. *See* view facing page 413.

Cala Grande and Cala Rotonda are entered between Punta Sottile and Scogli Correnti. 5

Scogli Correnti are low black rocks lying close off a point about $1\frac{1}{4}$ miles south-south-eastward of Punta Sottile.

Isolotto Galera and Isolotto Galeotta are low whitish rocky islets, respectively, about one-quarter of a mile and half a mile east-south-eastward of Scogli Correnti; the former lies on the coastal bank, and the latter on a small detached shoal. 10

Isolotto Preveto, high and rocky, lies close north-eastward of Isolotto Galeotta. The channel northward of it is about one cable wide, with depths of 2 fathoms (2^m7). 15

Punta Longa, a very low, whitish, rocky projection, on the root of which are some buildings, lies about three-quarters of a mile eastward of Isolotto Preveto.

Insenatura del Passo is entered between Isolotto Preveto and Punta Longa, and in its approach lies a chain of above-water rocks, named Scogli Palumbo. 20

Punta Fanfalo is about $1\frac{1}{2}$ miles east-south-eastward of Punta Longa, and the shore of the bay between them is fringed with rocks, both sunken and awash.

The south-eastern coast of Isola Favignana, between Punta Fanfalo and Punta Rossa, about $1\frac{1}{2}$ miles north-north-eastward, is low, but is backed by steeply rising ground strewn with whitish boulders. 25

Punta Marsala, the south-eastern extremity of the island, is about half a mile eastward of Punta Fanfalo; there is a stone landing place near this point. 30

A light is exhibited, at an elevation of 61 feet (18^m6), from a white, circular tower and dwelling, 62 feet (18^m9) in height, situated on Punta Marsala. A fog signal is sounded from this lighthouse. *See* view facing page 413. 35

Cala Rossa, with depths of less than 5 fathoms (9^m1), is entered westward of Punta Rossa; its shores are steep cliffs.

From the western entrance point of Cala Rossa the coast trends about one mile north-westward to Punta San Nicolo and is free from off-lying dangers. 40

Tunny nets are laid out annually in the vicinity of Punta San Nicolo, and also about one mile south-eastward of Punta Faraglione. *See* page 27.

Anchorage.—Cala Grande and Cala Rotonda afford temporary anchorage to small craft, with local knowledge, in depths of $3\frac{1}{4}$ fathoms (5^m9). 45

Insenatura del Passo affords shelter from north-westerly and north-easterly winds to small vessels with local knowledge; the bottom is of sand and weed.

Anchorage, well sheltered from north-westerly and north-easterly winds, can be obtained in the bay eastward of Punta Longa, in a depth of about 8 fathoms (14^m6), weed, with the cupola of the church at Favignana, *see* below, bearing 350° , and the southern extremity of Punta Longa in line with the southern side of Isolotto Preveto, 50

Charts 170, 165, 1440, 2158a and b.

Chart 189.

bearing about 273°. Small craft with local knowledge can anchor closer inshore.

- 5 Good anchorage can be obtained in a depth of $6\frac{1}{2}$ fathoms (11^m9), about $2\frac{1}{2}$ cables offshore, between Punta Fanfalo and Punta Marsala; this anchorage is known as Pietra Cadute.

- 10 Anchorage can be obtained, in fine weather or with westerly winds, anywhere off the coast between Punta Marsala and Punta Rossa, in depths of $6\frac{1}{2}$ fathoms (11^m9), good holding ground of sand and weed, on a bank which joins the island to the mainland of Sicily; this anchorage is known as Bove Marino.

Cala Rossa affords good shelter to small craft during south-westerly winds.

- 15 **Off-lying shoal.**—Secca del Toro, with a least depth of $3\frac{1}{2}$ fathoms (5^m9), rock, lies about 2 miles southward of Punta Longa (*Lat.* 37° 53' N., *Long.* 12° 19' E.).

Chart 2113, plan of Porto di Favignana.

- 20 **Porto di Favignana.**—**Light.**—This, the principal port in Isola Favignana, lies at the head of a bay which is entered between Punta San Nicolo and Punta Faraglione, and has depths of less than 3 fathoms (5^m5). On its western side is a large fish-canning factory, and on its eastern side is the small town of Favignana in which is Villa Florio, a prominent large, dark-grey building, with a belvedere. In the middle of the town, about one cable east-south-eastward of Villa Florio, is the church, with a remarkable green cupola, and on the southern side of the town is an old fort. Tunny nets, *see* page 27, are laid out annually in the approaches to the port.

- 30 A masonry jetty extends about half a cable north-westward from the eastern side of the cove, and has depths of about 10 feet (3^m0) at its head. There are two landing places, one of which belongs to Villa Florio, northward of the jetty.

A light is exhibited, at an elevation of 18 feet (5^m5), from a red iron column, 15 feet (4^m6) in height, situated on the head of the jetty.

- 35 **Anchorage.**—Anchorage can be obtained off Porto di Favignana, in a depth of about $12\frac{1}{2}$ fathoms (22^m9), poor holding ground of sand and weed, with the cupola of the church bearing 144°, and the signal station in Forte Santa Caterina bearing 216°. This anchorage is exposed to northerly winds, which are strong enough in winter to make it dangerous.

40 *Chart 170.*

WESTERN SIDE OF SICILY. — Coast. — Caution. — From Capo San Vito, *see* page 429, the western coast of Sicily trends about $3\frac{1}{2}$ miles southward to Punta Lunga (*Lat.* 38° 08' E., *Long.* 12° 43' E.), a low point that is not easily identified.

- 45 Torre Isolella is a square, partly ruined tower on the edge of the cliffs about one mile north-north-eastward of Punta Lunga, and in a ravine between them is the village of Maccari.

- 50 Monte Passo di Lupo is a conical peak 2,823 feet (860^m1) high, about $1\frac{1}{2}$ miles east-south-eastward of Punta Lunga. About $2\frac{1}{2}$ miles south-westward of Monte Passo di Lupo, Monte Palotimone, a sharp peak, rises to an elevation of 1,952 feet (595^m0).

Punta Barone, about 3 miles west-south-westward of Punta Lunga, is the extremity of a rounded projection on which Monte Cofano rises

Charts 165, 1440, 2158a and b.

Chart 170.

to an elevation of 2,162 feet (659^m0), and is a prominent feature. See view on chart 170. Torre del Corfano, a partially ruined, rectangular tower, stands on Punta Barone and is a good mark. Tunny nets, *see* page 27, are laid out annually between Punta Barone and Punta Pizzolungo, *see* below. 5

Torre Baia is an inconspicuous ruin situated on the eastern side of the promontory of which Punta Barone is the extremity; about one-quarter of a mile north-eastward of it lies Scoglio Cialandro, a low, black rock with foul ground between it and the point. 10

Off-lying bank.—Secca Scuso, with a depth of 48 fathoms (87^m8), rock, lies about 9 miles west-north-westward of Capo San Vito.

Anchorage.—Anchorage can be obtained, eastward of Scoglio Cialandro, in a depth of 6 fathoms (11^m0), sand, with Torre Baia bearing 270°, and the steep rocky eastern fall of Monte Palotimone, bearing 135°. 15

Charts 189, 170.

Coast.—Cala Baffuta is entered close south-westward of Monte Cofano (*Lat.* 38° 06' N., *Long.* 12° 40' E.).

Torre Cuddia stands, half a cable inland, about 2½ miles south-westward of the head of Cala Baffuta. 20

Torre Bonagia, on the coast about 1½ miles westward of Torre Cuddia, is surrounded by the buildings of a tunny fishery.

Punta Pizzolungo lies about 1½ miles westward of Torre Bonagia, and between them, near some houses, stands Torre Pizzolungo, a high, white, rectangular tower. About three-quarters of a mile south-eastward of Punta Pizzolungo, and at an elevation of 1,017 feet (310^m0), is a signal station, consisting of a large two-storied building, surmounted by a turret and flagstaff, which is normally closed to signal traffic. 30

Chart 189.

Secca Bonagia, a detached shoal with a depth of one fathom (1^m8), extends about 1½ miles north-eastward from a position about 4 cables northward of Punta Pizzolungo. The light-structure on Scoglio Asinelli, *see* below, bearing less than 241° and open south-eastward of the south-eastern extremity of Isola Levanzo, leads north-westward of this shoal. 35

Monte San Giuliano rises to an elevation of 2,464 feet (751^m0), about 2 miles south-south-eastward of Punta Pizzolungo, and is prominent especially from north-eastward. 40

The town of Erice stands on the summit of Monte San Giuliano. It is surrounded by ruined walls with some square towers, and at its eastern end are the ruins of a fortress. On the southern side of the town is a large circular tower which shows up well from westward and north-westward. 45

From Punta Pizzolungo, the coast trends about 2½ miles south-westward to Punta San Giuliano, a low rocky point on which are the buildings of a tunny fishery. Tunny nets, *see* page 27, are laid out annually in the vicinity of Punta San Giuliano.

Anchorage.—Temporary anchorage can be obtained south-westward of Monte Cofano, in a depth of 11 fathoms (20^m1), sand and good holding ground, about 3¼ cables offshore. Small vessels, with local knowledge, can enter Cala Baffuta, and anchor in a depth of 5 fathoms (9^m1) about 2¼ cables from the head of the cove. 50

Charts 165, 1440, 2158a and b.

Chart 189.

Off-lying dangers and banks.—Lights.—Scoglio Asinelli is a low, black rock, about $1\frac{1}{2}$ miles westward of Punta Pizzolungo, standing on a rocky shoal which extends about $1\frac{1}{2}$ cables westward of it. The
 5 navigable channel between the rock and the coast is about one mile wide. Tunny nets are laid out annually in the vicinity of Scoglio Asinelli, *see* page 27.

Scogli Porcelli, awash, lie about $4\frac{1}{2}$ miles west-south-westward of Scoglio Asinelli. They stand on a shoal extending about 2 cables
 10 northward, eastward and south-westward of them. On the middle of the group stands an inconspicuous pyramidal, iron, framework beacon, 28 feet (8^m5) in height, surmounted by a globe.

A light is exhibited, at an elevation of 74 feet (22^m6), from a circular, masonry tower, 79 feet (24^m1) in height, situated close to the beacon
 15 on Scogli Porcelli. *See* view facing page 413.

Banco San Giovanni, with a depth of $6\frac{1}{2}$ fathoms (11^m4), lies about one mile south-south-eastward of Scogli Porcelli.

Isolotto Maraone and Isolotto Formica lie on a detached bank, with depths of less than 10 fathoms (18^m3), about $3\frac{1}{2}$ miles south-
 20 south-westward of Scogli Porcelli, and in the middle of the channel between Isola Levanzo and the western coast of Sicily.

Isolotto Maraone, the western of the two islets, is low, bare and fringed by a rocky bank, with depths of less than 3 fathoms (5^m5), that extends about one cable north-westward from its north-western
 25 end.

Isolotto Formica, about 3 cables eastward of Isolotto Maraone, is fringed with a shoal bank on its western side. On the islet are a large low tower with a square base, and the buildings of a tunny fishery, and
 30 at its southern end is a small boat harbour. A small detached shoal, with a depth of $2\frac{3}{4}$ fathoms (5^m0), lies about $2\frac{3}{4}$ cables east-north-eastward of the islet. Tunny nets, *see* page 27, are laid out annually in the vicinity of Isolotto Formica. *See* view facing page 399.

A light is exhibited, at an elevation of 85 feet (25^m9), from a white circular turret on a building, 66 feet (20^m1) in height, situated on
 35 Isolotto Formica.

Secchetello is a bank, with depths of about 9 fathoms (16^m5), situated about one mile south-eastward of Isolotto Formica.

Chart 189, plan.

Porto di Trapani. — Dangers. — Lights. — Buoys. — This
 40 harbour is situated on the southern side of a low point terminating in a chain of above-water rocks, the north-westernmost of which is Punta Ligny. It is available to vessels 500 feet (152^m4) in length drawing up to 26 feet (7^m9), but is liable to silting, and is frequently dredged.

In addition to Torre Colombaia, *see* below, the green cupola of a
 45 church about $4\frac{1}{2}$ cables north-eastward of that tower, and the slightly smaller cupola of the cathedral close to a dark-coloured belfry about 2 cables farther east-north-eastward, are prominent either from northward or southward. The hospital, consisting of some low buildings with red roofs, about half a mile southward of the entrance of the
 50 harbour, is also prominent. The population of Trapani, in 1950, was about 79,000.

Punta Ligny lies about $1\frac{1}{2}$ miles west-south-westward of Punta San Giuliano, and Torre Ligny (*Lat.* $38^\circ 01' N.$, *Long.* $12^\circ 30' E.$) is a prominent square tower about 2 cables within its extremity.

Charts 170, 165, 1440, 2158a and b.

Chart 189, plan.

Scoglio Malconsiglio is 8 feet (2^m4) high, and is situated in the middle of a shoal about 1½ cables north-north-eastward of Punta Ligny.

Isolotto del Lazzaretto is a narrow island situated about one-quarter of a mile south-westward of Torre Ligny. On its north-western end stands Villino Nasi, a two-storied building, and at its south-eastern end are the buildings of a hospital. The island is connected with the mainland by a causeway.

Isolotto Colombaia lies about one-quarter of a mile southward of Isolotto del Lazzaretto, and between them the depths are shoal. At the eastern end of Isolotto Colombaia is Torre Colombaia, a fort in which is the tower of a disused lighthouse. From the fort, a breakwater, with a depth of 14 feet (4^m3) at its head, extends about 1½ cables south-south-eastward; there are mooring bollards and landing steps on the eastern side of the breakwater. There is a signal station on Isolotto Colombaia.

A light is exhibited, at an elevation of 30 feet (9^m1), from a red, iron, framework column on a white hexagonal hut, 23 feet (7^m0) in height, situated on the head of the breakwater extending from Torre Colombaia.

Scoglio Palumbo is the western of two islets close off the western end of Isolotto Colombaia.

A light is exhibited, at an elevation of 54 feet (16^m5), from a white, circular tower surmounting a one-storied octagonal dwelling, 41 feet (12^m5) in height, situated on Scoglio Palumbo. *See view facing page 413.*

Secca Ballata is a rocky shoal, with a depth of 10 feet (3^m0), lying within three-quarters of a mile northward of Scoglio Palumbo. Between these two are other rocks and shoals, amongst which is Secca Ballatella, with a depth of 10 feet (3^m0); they are covered by the red sector of Scoglio Palumbo light between the bearings of 131° and 176°.

The coast southward of the eastern entrance point of Porto di Trapani is bordered by a bank, which, with depths of less than 18 feet (5^m5), extends as much as 3 cables offshore. A detached 16-foot (4^m9) patch lies about 3 cables south-eastward of the head of the breakwater. Detached shoals, with depths of from 31 to 35 feet, lie within half a mile southward of the head of the breakwater.

Secca della Mauda, with depths of less than 3 feet (0^m9), lies on the northern side of the outer part of the harbour, between the eastern end of Isolotto Colombaia and Pontile della Sanità, about half a mile eastward.

Two lights, disposed vertically, are exhibited, the upper at an elevation of 26 feet (7^m9), from a red iron column on a white masonry hut, situated on the head of Pontile della Sanità (*Lat. 38° 01' N., Long. 12° 30' E.*).

Pontile della Sanità has depths of 20 feet (6^m1) at its head.

Scogliera del Ronciglio is a breakwater on the southern side of the entrance to the inner harbour, which extends about one cable north-westward from a position about 1½ cables southward of the head of Pontile della Sanità.

A light is exhibited, at an elevation of 33 feet (10^m1), from a white, iron framework structure on a white square masonry hut, 31 feet (9^m4) in height, situated on the head of Scogliera del Ronciglio.

There are wharves along the northern and southern sides of the inner

Charts 170, 165, 1440, 2158a and b.

Chart 189, plan.

harbour, and Banchina Isolella is situated at its head. There are depths of from 13 to 26 feet (4^m0 to 7^m9) alongside.

A channel, half a cable wide, which, in 1948, had depths of 29 feet 5 (8^m8), leads into the inner harbour. This channel is marked on its northern side by three red conical buoys, surmounted by cones.

Vessels drawing up to 23 feet (7^m0) can berth alongside several of the wharves in the inner harbour (*Lat.* 38° 01' N., *Long.* 12° 31' E.).

Anchorage.—Pilotage.—Caution.—Anchorage, sheltered from northerly winds, can be obtained about 2½ cables southward of Isolotto Colombaia, in depths of about 10 fathoms (18^m3), sand, shells, and weed, not good holding ground, or in depths of 6½ fathoms (11^m9), about 1½ cables southward of Scoglio Palumbo. These anchorages become dangerous in winter during south-westerly winds. With winds from south-east to south-west, anchorage can be obtained in the roadstead northward of the city, where the bottom is of rock and sand.

Pilots, *see* page 20, are available, and will board vessels off Isolotto Colombaia. It is dangerous to attempt to enter the harbour during southerly or westerly winds without local knowledge.

Seaplanes arrive and take off in the area in the outer harbour bounded, southward, by imaginary lines joining the head of the break-water extending from Torre Colombaia, the head of Scogliera del Ronciglio, and the head of Pontile della Sanità. When a seaplane is about to arrive at or depart from this area, a green flag will be displayed at Torre Colombaia and another at the head of Scoglio del Ronciglio, *see* page 23.

Port facilities.—Communications.—The principal exports are salt, building stone, tinned tunny, flour, wine, &c. There are hospitals. For deratisation *see* page 22. Minor repairs can be executed. A one-ton crane is available. There are a number of lighters.

Fresh provisions can be procured. Water is scarce; it is supplied at the quays by motor transport, and to vessels at anchor by water-boat.

A limited stock of petrol and lubricating oil is maintained, but these are more easily obtained at Palermo.

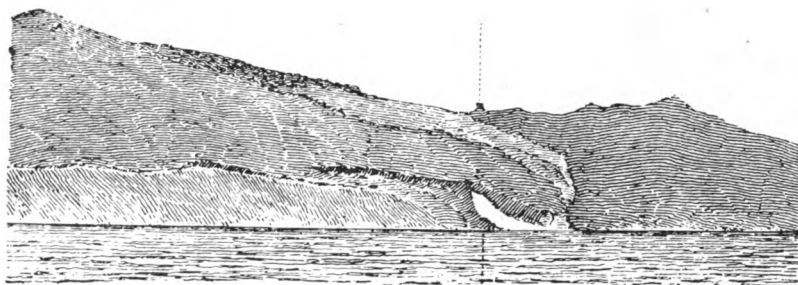
Chart 189.

Coast.—Dangers.—Light-buoy.—Punta Nubia lies about 2 miles southward of Trapani, and between them are extensive salt pans, which are often inundated by the sea. The salt thus deposited gives to this low-lying land the appearance of a plain covered with snow. On the slopes of the hills eastward of these salt pans are the towns of Xitta and Paceco. Torre Nubia stands on Punta Nubia; it is a white, square tower, 46 feet (14^m0) in height. From Punta Nubia a bank, with depths of less than 3 fathoms (5^m5), extends about three-quarters of a mile, and depths of less than 6 fathoms (11^m0) about 1½ miles offshore.

From Punta Nubia the coast trends about 4½ miles south-south-westward to Punta Tramontana, and is fringed by shoals, with depths of less than 6 fathoms (11^m0), extending as much as 1½ miles offshore in places. About midway between the points is the tall, rectangular, light-coloured Torre di Mezzo. On Punta Tramontana stands Torre San Teodoro, close to which there is a tower surmounted by a flagstaff.

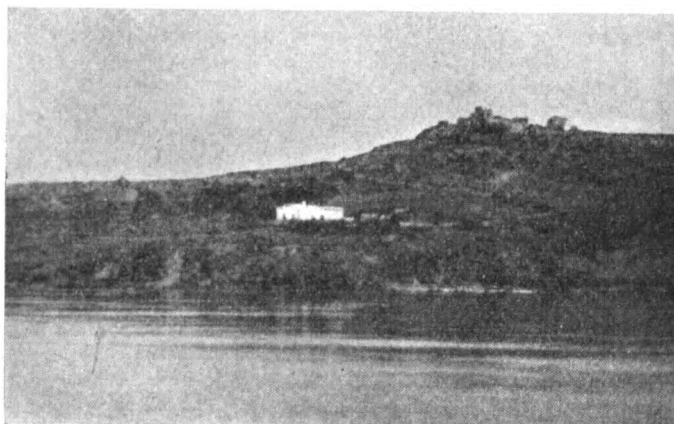
Secca del Fiume, about 1½ miles northward of Punta Tramontana, is a detached shoal, with a depth of 4½ fathoms (8^m7). A detached

Charts 170, 165, 1440, 2158a and b.



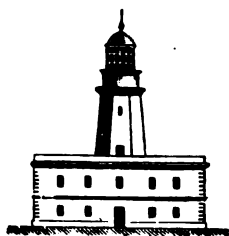
*Torre di Montechiaro
in line with white scar on
Punta Bianca, bearing 113°.*

Clearing mark for Scoglio Bottazza and La Secca.
(Original dated 1913.)

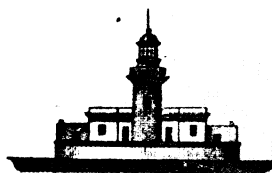


Lighthouse.

Capo San Marco from southward.
(Original dated 1936.)



Punta Libeccio
lighthouse.
(Original dated 1942.)



Capo Grosso light-
house.
(Original dated 1933.)



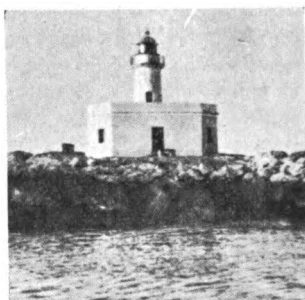
Punta Sottile
lighthouse.



Punta Marsala
lighthouse.



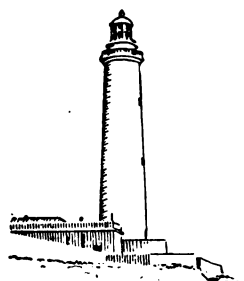
Scoglio Porcelli light-
house.



Scoglio Palumbo
lighthouse.



Porto di Marsala
main lighthouse.



Capo Granitolo
lighthouse.

(Originals dated 1942.)

Chart 189.

shoal, with depths of 6 fathoms (11^m0), lies about one mile westward of Secca del Fiume.

Punta Scario (*Lat.* 38° 54' N., *Long.* 12° 26' E.), the north-western extremity of Isola Grande, lies about 1½ miles west-south-westward of Punta Tramontana, and from it a bank, with depths of less than 5 fathoms (11^m0), extends about 1½ miles north-westward.

A can-shaped light-buoy, painted red and white in horizontal bands and exhibiting a *red flashing light every five seconds*, marks the north-western extremity of the bank extending from Punta Scario. 10

Isola Grande has numerous salt pans, and between it and the coast is an extensive area of very shallow water, named Stagnone, in which are some islets, and numerous rocks. The western coast of Isola Grande is fringed with a shoal bank extending about one mile offshore. 15

Capo Lilibeo, the western extremity of Sicily, is situated about 1½ miles south-south-westward of Punta dello Stagnone, the southern extremity of Isola Grande. This cape is low and on it stand some prominent buildings; it is fringed by a bank, which, with depths of less than 3 fathoms (5^m5), extends as much as three-quarters of a mile offshore. There are depths of 6 fathoms (11^m0) about 1½ miles westward of Capo Lilibeo, and a detached 2½-fathom (5^m0) patch lies 1½ miles northward of the cape.

Anchorage.—Temporary anchorage during south-easterly winds can be obtained southward of Secca del Fiume, with Torre San Teodoro bearing 150°. 25

Chart 2113, plan of Porto di Marsala.

Porto di Marsala.—**Lights.**—The town, which, in 1950, had a population of about 60,000, is situated within Capo Lilibeo. In it are the large and prominent yellow cathedral, which dominates the surrounding buildings, and the cupola of the church of San Francesco, which is situated in the northern part of the city but is low and inconspicuous; on the water-front are the large buildings of some of the wine-producing firms. 30

The harbour is protected by Molo di Ponente and Molo di Levante, the opening between the heads of which faces south-south-westward, and is about one cable wide. From a position near the head of Molo di Ponente, a breakwater extends about 3 cables southward.

A light is exhibited, at an elevation of 34 feet (10^m4), from a square concrete column on a red hut, 30 feet (9^m1) in height, situated on the head of the breakwater (*Lat.* 37° 47' N., *Long.* 12° 26' E.). 40

A light is exhibited, at an elevation of 62 feet (18^m9), from a white circular tower and dwelling, 62 feet (18^m9) in height, situated on the head of Molo di Ponente. See view facing this page.

A light is exhibited, at an elevation of 33 feet (10^m1), from a concrete structure on the balcony of a two-storied building, 28 feet (8^m5) in height, situated on the head of Molo Levante. 45

There are depths of from one to 3½ fathoms (1^m8 to 5^m9) in the harbour; the north-eastern part of which is shoal. Il Marrobbio, see page 9, is occasionally experienced in the harbour, and causes strong currents, as a precaution against which vessels are moored parallel with the moles so that these currents are met end on. 50

Small vessels can lie alongside the outer part of the eastern side of the breakwater between its head and the first landing steps northward of the head. 55

Charts 170, 165, 1440, 2158a and b.

Chart 2113, plan of Porto di Marsala.

A small concrete wharf, situated near the middle of the northern side of Molo di Levante, is available to vessels drawing 13 feet (4^m0).

Banchina dei Mille, in the north-western part of the harbour, has 5 depths of 13 feet (4^m0) alongside. Two red cylindrical warping buoys are moored south-westward and west-north-westward, respectively, of the western extremity of Banchina dei Mille.

A small pier extends from the middle of the north-eastern side of the harbour, and there is a wharf, near the Harbour Master's office, 10 farther north-westward.

Pilotage, *see* page 20, is compulsory. Pilots will board vessels about one mile from the head of the breakwater.

Anchorage.—Anchorage can be obtained, in a depth of 6 fathoms (11^m0), clay and weed, with the head of the breakwater in line with 15 that of Molo di Ponente bearing about 021°. Small vessels can obtain shelter from north-westerly winds under the lee of the breakwater.

It is dangerous to enter the harbour during a south-easterly gale.

Port facilities.—There is a hospital at Marsala.

Small quantities of provisions can be procured. Water is laid on 20 to the wharf (*Lat.* 37° 47' N., *Long.* 12° 26' E.).

Minor repairs can be effected; lighters are available, and there is a one-ton crane on the wharf near the Harbour Master's office.

Coast.—**Light.**—From Marsala, the coast trends about 4 miles south-south-westward to Punta Sibiliana, and is low and well culti- 25 vated. This stretch of coast is fringed by a bank, which, with depths of less than 3 fathoms (5^m5), extends as much as half a mile offshore. Torre Sibiliana, a square, dilapidated, dark-red tower, with some low buildings near it, stands on Punta Sibiliana.

Charts 170 and 186.

30 Capo Feto, about 4½ miles south-eastward of Punta Sibiliana, is very low; the intervening coast and the cape are fringed with shoals extending as much as half a mile offshore. The shoals off Capo Feto are covered by the *red* sector of the light on the eastern mole at Mazara del Vallo, between the bearings 088° and 118°.

35 A light is exhibited, at an elevation of 41 feet (12^m5), from the balcony of a white, square, two-storied building, 33 feet (10^m1) in height, situated on Capo Feto.

From Capo Feto, the low coast trends about 3 miles east-south-eastward to Mazara del Vallo, and is fringed with a shoal bank extending 40 half a mile offshore in places.

Mazara del Vallo.—**Lights.**—**Buoyage.**—This town, which, in 1950, had a population of about 35,000, is easily identified by the numerous and prominent cupolas and belfries of its churches. The most noticeable are:—The cupola of the cathedral, about 150 feet 45 (45^m7) high, with a greyish-reddish belfry, 158 feet (48^m1) high, close to it; the twin belfries of the church of S. Veneranda; and the belfry of San Francesco church, in the north-western part of the town, which is isolated, square, and surmounted by a pyramid. On the western side of the harbour, near the root of the western mole, is a 50 prominent white statue. The principal exports are wine, grain, pickled sardines, &c.

The harbour is the estuary of Torrente Mazaro, on either side of the mouth of which is a mole. The entrance between the mole heads is about one cable wide, but the navigable channel is reduced by shoals

Charts 165, 1440, 2158a and b.

Charts 170 and 186.

on either side to a width of about 45 yards (41^m1). Vessels not exceeding 165 feet (50^m3) in length can enter. On the inner side of the eastern mole and on the eastern side of the estuary of the river are wharves. The harbour is subject to silting, and is periodically dredged. In 1951, the inner part of the harbour was being dredged to a depth of 14½ feet (4^m4).

A light (*Lat.* 37° 39' N., *Long.* 12° 36' E.) is exhibited, at an elevation of 28 feet (8^m5), from an iron column on a red, conical, masonry hut, 23 feet (7^m0) in height, situated near the head of the western mole. 10

A light is exhibited, at an elevation of 38 feet (11^m6), from an iron column on a red, conical hut with a white¹ cornice, 31 feet (9^m4) in height, situated on the head of the eastern mole.

Two lights are exhibited on the eastern side of the harbour, which in line bear 020°. These lights are only for use within the harbour, for they lead over the shoal bank on the eastern side of the entrance channel. 15

A red triangular, iron beacon, surmounted by a globe, stands near the imaginary line joining the two mole heads, and marks the southern extremity of the shoal bank on the western side of the entrance. 20

A black conical buoy, surmounted by a cone, point up, marks the shoal bank in the eastern side of the entrance, and is moored about one cable south-south-westward of the head of the eastern mole.

A red conical buoy, surmounted by a cylinder, marks the shoal bank in the western side of the entrance, and is moored about 80 yards (73^m1) westward of the head of the eastern mole. 25

Pilots, *see* page 20, are available, and entry should not be attempted without their assistance.

Anchorage.—Anchorage can be obtained off the entrance of the harbour. A good berth is, in depths of 5½ or 6 fathoms (10^m1 or 11^m0), with the light-structure on the head of the western mole in line with the belfry of San Francesco church; the bottom is rock and weed, but the holding ground is good.

Port facilities.—There is a small hospital at Mazara del Vallo. Provisions can be procured. Water is laid on to the wharves, and a small tank vessel is available. 35

A number of lighters are available, and there is a 3-ton crane at the Custom House wharf.

Chart 186.

Coast.—Light.—From Mazara del Vallo, the coast trends about 6½ miles south-south-eastward to Capo Granitola, and is free from off-lying dangers. 40

Fiume Arena flows into the sea about 1½ miles south-south-eastward of Mazara del Vallo, and a submarine cable, the route of which is indicated by a wavy line on the chart, is landed at its north-western entrance point, *see* page 19. 45

A disused lighthouse, with a dilapidated, white, circular tower close to it, stands on Capo Sorello about three-quarters of a mile north-north-westward of Capo Granitola, and between lie the white houses of a fishing village. 50

Capo Granitola, *see* view facing page 413, is low and fringed with rocks. A rocky 2½-fathom (5^m0) patch lies about one mile south-eastward of the cape.

A light is exhibited, at an elevation of 123 feet (37^m5), from a white,

Charts 165, 1440, 2158a and b.

Chart 186.

circular tower on a low white dwelling, 116 feet (35^m4) in height, situated on Capo Granitola.

Tunny nets, *see* page 27, are laid out annually in the vicinity of 5 Capo Granitola.

SOUTHERN SIDE OF SICILY.—Coast.—Dangers.—Light.—

From Capo Granitola, the coast trends about 17½ miles eastward to Capo San Marco, forming a bay that is free from off-lying dangers.

Torre Tre Fontane (*Lat.* 37° 34' N., *Long.* 12° 44' E.) is a low dilapidated quadrangular tower standing on the coast about 3 miles eastward of Capo Granitola; close westward of the tower are some cottages.

Fiume Modione and Fiume Belice flow into the sea about 4½ and 6½ miles, respectively, eastward of Torre Tre Fontane; between their mouths are the ruins of the ancient city of Selinunte. The mouth of 15 Fiume Belice is easily identified by a group of trees and by a suspension bridge which spans it. Close eastward of the ruins is the small village of Marinella di Castelvetro.

Castelvetro is a town, at an elevation of 623 feet (189^m9), about 6 miles north-north-westward of Marinella di Castelvetro. Campo- 20 bello di Mazara is situated, at an elevation of about 330 feet (100^m6), about 5½ miles west-north-westward of Marinella di Castelvetro, and is dominated by a tower.

Porto Palo di Menfi, about 2 miles eastward of the mouth of Fiume Belice, lies on the eastern side of Capo Scaro, a small rocky point on 25 which stands a high, white tower. A mole extends about half a cable south-eastward from the coast, and from its head a rocky shoal, with depths of from 10 to 13 feet (3^m0 to 4^m0), extends about half a cable east-south-eastward; there are depths of 20 feet (6^m1) close to the extremity of the shoal. Close eastward of the mole there is a rocky 30 projection, which must be avoided by vessels going alongside the mole.

The town of Menfi, which shows up well, stands, at an elevation of 390 feet (118^m9), about 3 miles north-eastward of Porto Palo di Menfi.

Two prominent, white houses stand 3½ and 5½ miles, respectively, 35 south-eastward of Porto Palo di Menfi. About three-quarters of a mile south-westward of the north-western house, lies a detached 4½-fathom (8^m7) patch, and about half a mile north-westward of the south-eastern house is the mouth of Fiume Carbo or Carabi.

Chart 2113, plan of Rada di Sciacca.

40 Capo San Marco is an irregular reddish projection, on the summit of which, at an elevation of 253 feet (77^m1), stands Torre Mazzone, a prominent, white, cylindrical tower, with some cottages near it. *See* views on chart 186 and facing page 412. The cape is fringed with rocks, and a detached rocky patch, with a depth of 4½ fathoms (8^m7), 45 lies about three-quarters of a mile south-south-eastward of it. Tunny nets, *see* page 27, are laid out annually about 1½ miles eastward of Capo San Marco.

A light is exhibited, at an elevation of 100 feet (30^m5), from a white tower, 26 feet (7^m9) in height, in front of a white one-storied dwelling, 50 situated on Capo San Marco (*Lat.* 37° 30' N., *Long.* 13° 01' E.).

Some buildings, in connection with the tunny fishery, with a tall chimney, are situated near the mouth of Torrente Foggia di Mezzo, about three-quarters of a mile east-north-eastward of Capo San Marco.

Charts 165, 1440, 2158a and b.

Chart 2113, plan of Rada di Sciacca.

Signal station.—A signal station, which operates by day only, is situated on Capo San Marco.

Anchorage.—Vessels, with local knowledge, can obtain open anchorage southward of the buildings of the tunny fishery, but during the season care must be taken to avoid the tunny nets.

Porto di Sciacca.—Light.—Buoy.—The town of Sciacca, which, in 1950, had a population of about 23,000, stands on a steep slope about 3 miles eastward of Capo San Marco, and is surrounded by an irregular wall. At its eastern end there are the remains of a castle with a circular tower. At its western end is a church, the green cupola of which is visible from seaward; close south-south-westward of this cupola is a water tank. In the northern and higher part of the town stands another church, with a small but noticeable belfry. On the shore, close westward of the town, are three factory buildings and a prominent chimney. Close eastward of the town lies Punta Pertuso, with a hole through it, and easily identified by its bright yellow cliffs, surmounted by some buildings, on one of which is a red cupola.

The harbour is protected by a mole, which extends about 2 cables westward from a position about 2 cables westward of Punta Pertuso, and its head branches north-westward and south-westward. About one-quarter of a mile north-westward of the head of the mole is a small breakwater extending southward from the coast.

The harbour is liable to silting, and entry is difficult on account of several rocky patches. In 1951, there were depths of 11 feet (3^m4) in the harbour (*Lat.* 37° 30' N., *Long.* 13° 05' E.).

A light is exhibited, at an elevation of 34 feet (10^m4), from a red, iron, framework structure, 23 feet (7^m0) in height, situated on the northern branch of the head of the mole.

A red cylindrical warping buoy lies about 3 cables south-westward of the head of the mole.

Dangers in approach.—Three shoals, with depths of 2½ fathoms (4^m6), lie, respectively, 1½, 2½ and 4½ cables west-south-westward of the light-structure on the head of the mole; and a 6-fathom (11^m0) shoal lies 4 cables offshore about 7 cables south-eastward of the light-structure.

Anchorage.—Pilotage.—Open anchorage can be obtained, in a depth of about 8 fathoms (14^m6), sand, with the light-structure at the head of the mole at Porto di Sciacca bearing 059°, distant about half a mile.

There is an authorised pilot, and no vessel should attempt to enter without local knowledge. Previous notice should be given. *See page 20.*

Port facilities.—Provisions can be procured. Water is scarce. Small stocks of coal and fuel oil are usually available. There is a hospital in Sciacca. A few small lighters are available, and there is a 4-ton crane on the quay. Small repairs can be executed. There is a small gridiron.

Coast.—Dangers.—Light.—From Sciacca, the coast trends east-south-eastward and is fringed with rocks.

Monte San Calogero, on which stand a church and an hotel at an elevation of 1,266 feet (385^m9), is situated about 1½ miles north-eastward of Sciacca, and is a prominent feature.

Chart 186.

Pico di Caltabellotta, 3,114 feet (949^m1) high, is a prominent peak, situated about 5½ miles north-eastward of Monte San Calogero.

Charts 165, 1440, 2158a and b.

Chart 186.

Torre Macauda, a dilapidated but remarkable rectangular building, surmounts a rocky bluff, 226 feet (68^m9) high, about 4½ miles east-south-eastward of Sciacca.

- 5 Shoals, with depths of less than 5 fathoms (9^m1), lie about 2 miles westward of Torre Macauda.

Torre Verdura (*Lat.* 37° 28' N., *Long.* 13° 12' E.) is a grey, square tower, with a large, flat-roofed building attached to it, situated about three-quarters of a mile south-south-eastward of Torre Macauda; it shows up well from seaward.

Shoals, with depths of less than 5 fathoms (9^m1), lie within 1½ miles southward and south-westward of Torre Verdura.

Fiume Verdura flows into the sea about half a mile south-eastward of Torre Verdura; its banks are lined with rows of trees.

- 15 Fiume Magazzolo and Fiume Platani flow into the sea about 3½ and 5½ miles, respectively, south-south-eastward of Fiume Verdura.

Capo Bianco, flat-topped and about 100 feet (30^m5) high, is a salient projection close southward of the mouth of Fiume Platani; it is flanked by white cliffs and fringed with shoals extending about half a mile offshore. A detached 3½-fathom (5^m9) patch lies about one mile south-eastward of the cape.

From Capo Bianco, the coast trends about 10 miles south-eastward to Capo Rossello; sunken rocks and shoals lie within half a mile of this stretch of coast, in places.

- 25 Torre Salsa, a square, reddish building with one window, and its upper part dismantled, surmounts a bluff about 200 feet (61^m0) high, about 2½ miles south-eastward of Capo Bianco. Tunny nets, *see* page 27, are laid out annually in the vicinity of Torre Salsa.

Siculiana Marina is a small village on the coast about 3½ miles south-eastward of Torre Salsa, and close eastward of it is a tunny fishing establishment with a tall chimney. A rock, with a depth of less than 6 feet (1^m8), lies about 3 cables south-westward of Siculiana Marina.

- 35 Torre di Monte Rosso is a large dark-coloured square tower surmounting a coastal hill, 430 feet (131^m1) high, about 2½ miles south-eastward of Siculiana Marina and between them is a sandy beach.

Capo Rossello is a dark, reddish, cliffy projection fringed with rocks; two low rocks lie about 1½ cables south-eastward of it and are visible from westward and south-eastward.

- 40 A light is provisionally exhibited from Capo Rossello.

From Capo Rossello, the coast trends about 3½ miles eastward to Porto Empedocle; it is high, precipitous and fringed in places with rocks. Close eastward of Capo Rossello is a sandy beach.

Chart 190, plan of Approach to Port Empedocle.

- 45 Monserrato is a prominent hill, 1,037 feet (316^m1) high, with cliffs facing westward near its summit, which is situated about 1½ miles northward of Porto Empedocle; *see* view on chart 190.

Off-lying banks.—For the banks off-lying the western part of the southern coast of Sicily, *see* page 377.

- 50 *Chart 2113, plan of Port Empedocle.*

Porto Empedocle.—Lights.—This is the only harbour in the southern coast of Sicily that affords protection from southerly winds. It consists of Avamporto and Porto Vecchio.

Avamporto is protected by Molo di Levante and Molo di Ponente

Charts 165, 1440, 2158a and b.

Chart 2113, plan of Port Empedocle.

extending southward from the coast ; the former curves south-westward toward the head of the latter. The entrance between the heads of these moles faces south-eastward and is about one cable wide. Avamporto has depths of from 3 to $4\frac{1}{2}$ fathoms (5^m5 to 8^m2) in its southern and south-eastern parts. There are bollards on the eastern mole. Alongside the outer 650 feet (198^m4) of Molo di Ponente, there were, in 1951, depths of from $2\frac{3}{4}$ to $3\frac{1}{4}$ fathoms (5^m0 to 5^m9). 5

Porto Vecchio, within Avamporto, lies between the inner part of Molo di Levante and Molo Francesco Crispi, which curves south-eastward from a position about midway between the roots of the two outer moles. A prominent, square tower stands near the root of Molo Francesco Crispi. In 1950, there were depths of 23 feet (7^m0) alongside Banchina Nord, on the northern side of Porto Vecchio, and of 19 feet (5^m8) alongside Molo Francesco Crispi. There is a small mooring buoy in Porto Vecchio. 10

A small shoal, with a depth of about $3\frac{1}{4}$ fathoms (5^m9), lies about one cable south-eastward of the head of Molo di Ponente.

A light is exhibited, at an elevation of 28 feet (8^m5), from an iron framework structure on a cylindrical masonry hut, 23 feet (7^m0) in height, situated on the head of Molo di Ponente. 20

A light (*Lat.* $37^\circ 17' N.$, *Long.* $13^\circ 32' E.$) is exhibited, at an elevation of 30 feet (9^m1), from an iron framework structure on a masonry hut, 25 feet (7^m6) in height, situated on the head of Molo di Levante.

Two lights, disposed vertically 3 feet (0^m9) apart, are exhibited, at an elevation of 20 feet (6^m1), from a red iron column situated on the head of Molo Francesco Crispi. 25

With strong south-easterly or south-westerly winds entry is difficult. *Chart 190, plan of Approach to Port Empedocle.*

Anchorage.—Open anchorage can be obtained, in depths of about 30 7 fathoms (12^m8), good holding ground, with the light-structure at the head of Molo di Ponente bearing 333° , distant about $5\frac{1}{2}$ cables ; but it is unsafe with onshore winds.

Chart 2113, plan of Port Empedocle.

Port facilities.—**Pilotage.**—Provisions are procurable. Water is laid on to Molo Francesco Crispi or can be supplied in a small tank vessel. A small stock of coal is maintained. Molo di Levante is connected with the railway system. 35

A number of lighters are available. Minor repairs can be executed. There is a diver. 40

Pilotage is compulsory ; see page 20.

The port is a centre of the fishing industry. The principal exports are sulphur, rock salt, and chalk.

In 1950, the town had a population of about 16,000.

Coast.—Punta Agragas lies about $2\frac{3}{4}$ miles south-eastward of Porto Empedocle, and close north-westward of it Fiume Agragas (Agrigento) flows into the sea. There are some buildings on the eastern bank near the mouth of the river. 45

The town of Agrigento (*Lat.* $37^\circ 19' N.$, *Long.* $13^\circ 35' E.$) stands, at an elevation of about 1,070 feet (326^m1), about 2 miles eastward of Monserrato ; it is easily identified from seaward. In 1950, the population was about 27,000. 50

Rupe Atenea, close south-eastward of Agrigento, has a steep-sided flat summit, 1,152 feet (351^m1) high, and is a very prominent feature.

Charts 186, 165, 1440, 2158a and b.

Chart 2113, plan of Port Empedocle.

On its western extremity stands a small ruined tower. The ruins of numerous ancient temples stand about one mile southward of Rupe Atenea.

- 5 **Off-lying shoals.**—La Secca is a detached, rocky shoal, with a depth of 3 fathoms (5^m5), lying about 2½ miles south-south-westward of Punta Agragas.

Scoglio Bottazza, with a depth of one fathom (1^m8), lies about three-quarters of a mile offshore 2½ miles south-eastward of Punta Agragas.

- 10 The summit of Monserrato in line with the head of Molo di Levante at Porto Empedocle, bearing about 006°, leads over one mile westward of La Secca.

Torre di Monte Rosso open southward of Capo Rossello, with the latter bearing more than 315°, leads at least 3 cables south-westward of

- 15 La Secca.

Torre di Montechiaro, *see* below, in line with the white scar on Punta Bianca, bearing 113°, *see* view facing page 412, leads about 6½ cables south-westward of Scoglio Bottazza and 2 cables north-eastward of La Secca.

- 20 *Chart 186.*

Coast.—Dangers.—Favara, a town about 4 miles eastward of Agrigento, is visible from seaward on certain bearings, and its cathedral, with a cupola and a red roof, is a good mark. In 1950, the population was about 20,000.

- 25 Fiume Naro flows into the sea about 2½ miles south-eastward of Punta Agragas, and about 3 miles farther south-eastward lies Punta Bianca, which has on it a very white scar, which is prominent, and from westward appears as an isosceles triangle. There are depths of less than 1½ fathoms, within 2 cables southward and westward of the point.

- 30 Pietra Patella is a small dark-coloured rock, about 3½ cables south-westward of Punta Bianca.

Torre di Montechiaro is a prominent castle standing on a rocky eminence, with some remarkable whitish fissures on its westward side, about 1½ miles south-eastward of Punta Bianca.

- 35 Marina di Palma is a small village on the coast, about 1½ miles south-eastward of Torre di Montechiaro, and about half a mile south-eastward of it is the mouth of Fiume Palma. The village is the landing place for Palma di Montechiaro, a town about 2 miles north-eastward that is only visible from seaward on certain bearings.

- 40 *Charts 186 and 187.*

Torre San Carlo is a large, square tower situated close south-eastward of the mouth of Fiume Palma.

Castellazzo di Palma, a small, ruined tower, stands on a range of barren, rocky hills, 925 feet (281^m1) high, about 3 miles east-south-

- 45 eastward of Torre San Carlo; it is not easily identified.

Chart 187.

Torre di Gaffi stands on Punta di Gaffi (*Lat.* 37° 08' N., *Long.* 13° 51' E.) about 2 miles south-eastward of Castellazzo di Palma. It is a cylindrical tower with a group of huts nearby.

- 50 Torre San Nicola is a prominent tower, prismatic in shape, standing on a light-coloured, rocky bluff, about 2½ miles south-south-eastward of Torre di Gaffi. Half a mile westward of it lies Punta San Nicola, close off which is Rocca San Nicolo, a prominent rock 100 feet (30^m5) high. Midway between the two towers stands a remarkable wind-
- 55 pump.

Charts 165, 1440, 2158a and b.

Chart 187.

Rocca Muddafedda, about three-quarters of a mile south-eastward of Torre San Nicola, is a large rock connected with the coast by a low sandy isthmus.

From Rocca Muddafedda, the coast trends about 3 miles eastward to Licata. It is rocky, backed by hills about 500 feet (152^m₄) high, and on it are two quarries, one of which can easily be identified by a whitish escarpment.

Anchorage.—In fine weather, open anchorage can be obtained by vessels with local knowledge, in a depth of 4½ fathoms (7^m₈), sand and good holding ground, with the above-mentioned wind-pump bearing 045°, at about 4½ cables offshore.

Small craft, with local knowledge, can obtain sheltered anchorage in a cove in the eastern side of Rocca Muddafedda.

Chart 187, plan of Port Licata.

Porto di Licata. — Lights. — Buoy. — Caution. — The town of Licata, which, in 1950, had a population of about 31,000, is situated at the mouth of Fiume Salso, its western part being on rising ground. On Monte Ecnomo, 492 feet (150^m₀) high, at the western side of the town stands the remarkable Castel S. Angelo, in which there is a signal station, consisting of a white building surmounted by a tower and flagstaff, 482 feet high, the seaward side of which is painted black and white in chequers. In the eastern part of the town stands the church of S. Angelo, with a prominent cupola. At the eastern extremity of the town two masonry bridges over Fiume Salso are noticeable.

Close to the root of Molo di Ponente there stands a prominent two-storied building with two chimneys. *See view facing page 426.* Sulphur, agricultural produce, fish, &c., are exported.

The harbour is formed by two moles and a breakwater. Molo di Levante extends south-south-eastward from the shore and then curves west-south-westward. Molo di Ponente extends south-south-eastward from a position about 3½ cables westward of the root of Molo di Levante. The entrance between the heads of these moles is about 1½ cables wide and faces south-south-westward. A detached, curved breakwater lies south-westward of the entrance forming two approaches, the north-western about one cable wide and the south-eastern about 1½ cables wide. In 1950, a curved breakwater was in course of construction at the mouth of the river, to protect the eastern entrance from silting. Along the northern side of Molo di Levante there is a wharf about 1½ cables long, which is connected with the railway system; at the head of the harbour there are several jetties. In the northern part of the harbour lie some rocks and shoals, the outermost of which is marked by a black staff and globe. A red conical buoy, surmounted by a cylinder, and a warping buoy are moored off the head of Molo di Ponente. A warping buoy is moored south-eastward of the beacon described above.

A light (*Lat. 37° 06' N., Long. 13° 57' E.*) is exhibited, at an elevation of 131 feet (39^m₉), from a white circular tower on a square, masonry base, 123 feet (37^m₅) in height, situated near the root of Molo di Levante.

Two lights are exhibited, at elevations of 34 feet (10^m₄), from iron columns on red masonry huts, 30 feet (9^m₁) in height, situated one on each end of the detached breakwater.

Two lights, disposed vertically, are exhibited at elevations of 26 and

Charts 165, 1440, 2158a and b.

Chart 187, plan of Port Licata.

18 feet (7^m9 and 5^m5), from an iron structure on a red masonry hut,
26 feet (7^m9) in height, situated on the head of Molo di Levante.

Two lights, disposed vertically, are exhibited at elevations of 25 and
5 18 feet (7^m6 and 5^m5), from an iron structure on a red masonry hut,
28 feet (8^m5) in height, situated on the head of Molo di Ponente.

Anchorage.—Pilotage.—Directions.—Open anchorage can be obtained, in a depth of 7½ fathoms (13^m7), good holding ground of mud and sand, with the main lighthouse in line with the cupola of the
10 church of S. Angelo, and with the light-structure at the eastern end of the detached breakwater bearing 315°. This anchorage is not recommended with south-easterly and south-westerly winds which raise a heavy sea.

Pilots, *see* page 20, are available; a vessel should not attempt to
15 enter the harbour without local knowledge.

Caution must be exercised when approaching from southward, for the detached breakwater is very low, and cannot be seen until close to; the best marks are the lighthouse at the root of Molo di Levante in line with the cupola of the church of S. Angelo, bearing about
20 349°.

Approaching from south-eastward, the signal station in Castel S. Angelo in line with the head of Molo di Levante, bearing 329°, are excellent marks.

Caution is necessary when securing to Molo di Levante for strong
25 east-going currents are sometimes experienced inside the entrance of the harbour, especially with westerly winds.

Port facilities.—There is a hospital in Licata.

Minor repairs could be effected, and there are two patent slips, one capable of taking vessels up to 400 tons. There are several lighters in
30 the port.

Small quantities of provisions can be procured. A small stock of coal is maintained.

Storm signals.—Storm signals are shown at the signal station.
See page 12.

35 *Chart 187.*

Coast.—The mouth of Fiume Salso is fronted by an extensive, shifting sandbank, and from the river mouth the coast trends about 13½ miles east-south-eastward to Capo Soprano, and is backed by hills, which, within a mile inland, rise to elevations of from 155 to 980 feet
40 (47^m2 to 298^m7).

Punta dei Due Rocchi, about 4½ miles eastward of Licata, may be identified by the two rocks from which it takes its name; seen from westward they are in line with one another.

Torre Falconara, about three-quarters of a mile eastward of Punta
45 dei Due Rocchi, stands on a small, rocky projection and is crenellated. It surmounts some dark buildings, and near it there are a few houses and a clump of trees.

Torre di Manfria (*Lat.* 37° 06' N., *Long.* 14° 09' E.), about 4 miles east-south-eastward of Torre Falconara, is in good repair, grey,
50 quadrangular, and has windows on its south-eastern side; it stands on the brow of a hill, 240 feet (73^m1) high, and behind it the hills rise to an elevation of 407 feet (124^m0).

Butera, a town in which is a tower, stands on an elevation of 1,319 feet (402^m0), about 5½ miles north-north-eastward of Torre di Manfria,

Charts 165, 1440, 2158a and b.

Chart 187.

and is visible from seaward on certain bearings. In 1950, it had a population of about 8,700.

Between Torre di Manfredia and Capo Soprano, is a plateau about 220 feet (67^m1) high, the seaward side of which falls steeply to a beach. 5

Capo Soprano is at the north-western end of another similar plateau, 155 feet (47^m2) high. Close off the cape is a reef that in fine weather affords shelter to small craft with local knowledge.

Monte Formaggio, 2,096 feet (638^m9) high and about 12 miles northward of Capo Soprano, is a prominent feature. 10

Gela.—Light.—This town, which had a population, in 1950, of about 40,000, stands on the summit and seaward slope of the plateau, about one mile eastward of Capo Soprano. Prominent objects in this town are :—The cupola of the cathedral, which is painted yellow and grey in vertical stripes ; a light-coloured chimney at the western 15 end of the town ; and the whitewashed belfry of a church, southward of the cathedral. The town is the centre of a cotton-growing industry and from it agricultural produce is exported.

A concrete pier extends about 1½ cables south-westward from the shore near the middle of the town, and near its head there are depths 20 of 2½ fathoms (5^m0). There are landing places on either side of the head of the pier (*Lat.* 37° 04' N., *Long.* 14° 15' E.).

A light is exhibited, at an elevation of 33 feet (10^m1), from an iron, framework structure, situated near the root of the pier.

Anchorage.—Open anchorage can be obtained, in depths of 25 5½ fathoms (10^m1), good holding ground of hard sand, about 1½ miles offshore, abreast the town. Anchorage can also be obtained, in a depth of 3½ fathoms (5^m9), on the line of the pier about 3½ cables from its head.

Port facilities.—Fresh provisions can be procured. A small stock 30 of coal is usually available. There are several cranes with a maximum capacity of 2 tons. A hospital is situated in the town.

Coast.—Lights.—From Gela the coast trends about 14 miles south-south-eastward to Scoglitti, and is mostly sandy and backed 35 by low hills.

Fiume Gela and Fiume Maroglio flow into the sea through a common mouth about three-quarters of a mile south-eastward of Gela, and about 4½ miles farther south-eastward is the mouth of Fiume Acate or Dirillo, with Lago di Bivieri close northward of it.

Punta Safaglione, about 6 miles south-south-eastward of the mouth 40 of Fiume Acate, is rocky and is fringed with rocks.

Scoglitti is a village where there is a cove available for small craft with local knowledge only. In 1950, the population was about 2,000. It is dominated by a white church with a dark belfry.

A light is exhibited, at an elevation of 51 feet (15^m5), from a red 45 masonry turret on a white one-storied house, 43 feet (13^m1) in height, situated at Scoglitti.

From Scoglitti the coast trends about 7 miles south-south-eastward to Capo Scalambri, and is fringed by a shoal bank and patches of rock, extending half a mile offshore in places ; it is backed by high dunes. 50

Punta del Bracetto lies about 4½ miles southward of Scoglitti, and on it stands a tower in front of a building.

Torre di Pietro, about 1½ miles south-south-eastward of Punta del Bracetto, is in ruins.

Chart 187.

Capo Scalambri or Scaramia (*Lat. 36° 47' N., Long. 14° 30' E.*) is low and rocky, and on it, westward of the lighthouse, are a group of houses and an old square tower. See view facing page 426. This cape is 5 fringed with rocks and should be given a wide berth; close eastward of it is the small natural harbour of Punta Secca, which is available for small craft with local knowledge only.

A light is exhibited, at an elevation of 123 feet (37^m5), from a white, circular tower, 113 feet (34^m4) in height, attached to a low dwelling 10 situated on Capo Scalambri. See view facing page 426.

From Capo Scalambri the coast trends about 15 miles east-south-eastward to Punta Religione, and is free from off-lying dangers.

Marina di Ragusa, about 3 miles eastward of Capo Scalambri, is the landing place for the town of Ragusa.

15 A light is exhibited, at an elevation of 26 feet (7^m9), from an iron, framework structure on a stone hut, 23 feet (7^m0) in height and painted black and white in horizontal bands, situated at Marina di Ragusa.

Fiume Irmínio, or di Ragusa, flows into the sea about 2 miles eastward of Marina di Ragusa, and its position may be identified by the 20 trees on either bank near its mouth. Close eastward of the mouth of the river is a low square tower attached to a building.

The village of Donnalucata lies about 2 miles east-south-eastward of the mouth of Fiume Irmínio, and is dominated by a group of reddish houses.

25 Punta Corvo, about 4 miles south-eastward of Donnalucata, is a low, rocky point, on which stand some houses.

The village of Sampieri is situated on a point about 1½ miles eastward of Punta Corvo, and on another point, about 1½ miles farther eastward, is a factory with a prominent chimney.

30 Punta Religione is surmounted by two white buildings; it is rocky and on either side of it there is a sandy beach.

Anchorage.—Open anchorage can be obtained off Scoglitti.

Pozzallo.—**Light.**—This town (*Lat. 36° 43' N., Long. 14° 52' E.*), which, in 1950, had a population of about 11,000, lies about 3½ miles 35 east-north-eastward of Punta Religione, and may be identified by Torre del Conte di Modica, a large square tower 98 feet (29^m9) high. A tall chimney stands close north-eastward of the town, and about one mile north-eastward there is a cemetery, standing on the slope of the hill.

A stone jetty extends 130 feet (39^m6) from the coast at the eastern 40 end of the town, and westward of it are some wooden piers.

A light is exhibited, at an elevation of 33 feet (10^m1), from a masonry column on a white tower with red horizontal bands, 23 feet (7^m0) in height, in front of a yellow one-storied building, situated at Pozzallo. See view facing page 426.

45 **Anchorage.**—Open anchorage can be obtained off Pozzallo, the best berth being off the light-structure.

Coast.—From Pozzallo the coast trends about 5½ miles south-eastward to a point, and consists of a yellow, sandy beach backed by marshes.

50 The town of Spaccaforro, which, in 1950, had a population of about 12,000, stands on a hill, 558 feet (170^m1) high, about 4½ miles north-eastward of Pozzallo, and is visible from seaward.

Dangers.—**Light.**—Isolotto Porri, the largest of a group of rocks, some of which are above water, lies about 1½ miles west-south-westward

Charts 3670, 165, 1800, 1440, 2158a and b.

Chart 187.

of the point at the eastern end of the above-mentioned, yellow, sandy beach.

Rocky shoals, with depths of 4, $5\frac{1}{2}$ and 7 fathoms (7^m3 , 10^m1 and 12^m8), lie about 7 cables south-westward and southward and $1\frac{1}{4}$ miles south-south-eastward, respectively, of Isolotto Porri. A detached 9-fathom (16^m5) patch lies about $1\frac{3}{4}$ miles southward of the islet.

A light is exhibited, at an elevation of 34 feet (10^m4), from a stone-coloured column on a small grey structure, situated on Isolotto Porri.

Coast.—Dangers.—Light.—Punta Castelluzzo lies about 3 miles eastward of Isolotto Porri, and between, the coast is fringed by rocks and shoals extending about one mile offshore. Punta Castelluzzo appears like a high narrow wall of light-coloured rock, rugged and flattish on the top.

Scoglio Iannuzzo, about one mile south-westward of Punta Castelluzzo, is a low round rock, and about $1\frac{3}{4}$ cables north-north-eastward of it is another rock. Between half a mile southward and one mile westward of Scoglio Iannuzzo, lie Secche di Circe with depths of from $2\frac{1}{4}$ to 5 fathoms (4^m1 to 9^m1).

Between Punta Castelluzzo and Punta delle Formiche, about $3\frac{3}{4}$ miles south-eastward, the coast forms a bay, the yellow, sandy shores of which are broken here and there by rocky points. Within one mile of its eastern shore lie some rocky 5-fathom (9^m1) patches, but in the middle of the bay the bottom is sand.

Punta delle Formiche is rocky and whitish in colour; several low, dark rocks lie within $2\frac{3}{4}$ cables southward of it.

A rocky shoal, with depths of 2 fathoms (3^m7), lies about three-quarters of a mile southward of Punta delle Formiche; a $5\frac{1}{4}$ -fathom (9^m6) patch lies close south-eastward of this shoal.

Isola delle Correnti, about $1\frac{1}{2}$ miles south-eastward of Punta delle Formiche, shows up well from eastward or westward; *see* view facing page 426. It is joined to the mainland by a low, narrow isthmus, which, in bad weather, is completely submerged and covered with breakers. On its eastern side is a small natural boat harbour. A bank, with depths of less than 3 fathoms (5^m5), extends about $1\frac{3}{4}$ cables south-south-westward of the island. A rocky shoal, with a depth of $2\frac{3}{4}$ fathoms (5^m0), lies about half a mile south-south-eastward of Isola delle Correnti (*Lat.* $37^\circ 38' N.$, *Long.* $15^\circ 16' E.$).

A light is exhibited, at an elevation of 54 feet (16^m5), from a polygonal tower, 30 feet (9^m1) in height, painted black and white in horizontal bands, attached to a large, low, white building situated on Isola delle Correnti. Another building stands close northward of the lighthouse. *See* view facing page 426.

From Isola delle Correnti the coast trends about $1\frac{3}{4}$ miles north-eastward to the south-western entrance point of Baia di Porto Palo, and is fringed by shoals extending 2 cables offshore.

The shores of Baia di Porto Palo are fringed with rocks. Two detached patches, with depths of 2 and $2\frac{1}{4}$ fathoms (3^m7 and 4^m6), respectively, lie in the entrance. A rocky bank, with depths of $3\frac{1}{4}$ fathoms (5^m9), extends about one cable southward of Punta di Porto Palo.

From Punta di Porto Palo, the low, rocky, eastern entrance point of Baia di Porto Palo, the coast, which consists of clay cliffs, trends

Charts 3670, 165, 1800, 1440, 2158a and b.

Chart 187.

about $1\frac{1}{4}$ miles north-eastward to the point off which lies Isola di Capo Passero, *see* page 480.

Off-lying banks.—A 9-fathom (16^m5) patch lies about 3 miles south-westward of Punta delle Formiche.

A small 9-fathom (16^m5) bank lies about one mile south-eastward of Isola delle Correnti (*Lat.* $37^\circ 38' N.$, *Long.* $15^\circ 16' E.$).

Anchorage. — Anchorage can be obtained, in a depth of $6\frac{1}{2}$ fathoms (11^m9), sand, with the building on Punta Castelluzzo bearing 298° , distant about one mile.

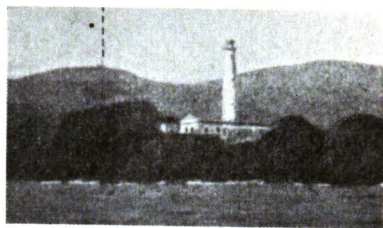
Anchorage can be obtained, during north-westerly winds, in a depth of about 8 fathoms (14^m6), from $4\frac{1}{2}$ to 5 cables offshore about midway between Isola delle Correnti and Punta di Porto Palo.

Baia di Porto Palo affords excellent shelter to small vessels with local knowledge during north-easterly winds.

Charts 3670, 165, 1800, 1440, 2158a and b.



Pozzallo lighthouse.
(Original dated 1942.)



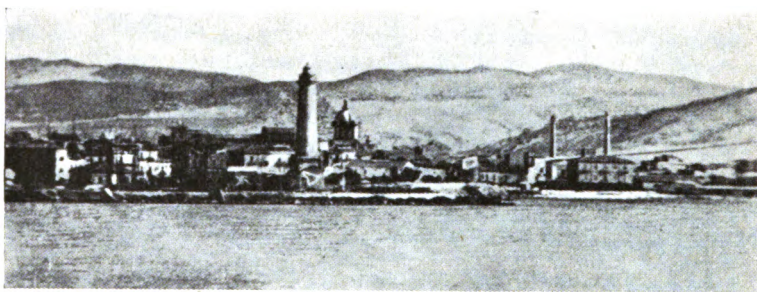
Punta Gavazzi lighthouse.
(Original dated 1936.)



Capo Scalambri from north-north-westward.



Lighthouse, bearing 271°.
Isola delle Corrienti from eastward.
(Originals dated 1942.)

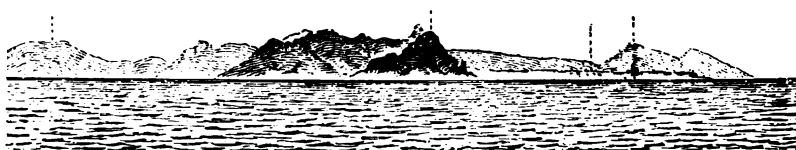


S. Angelo church.
San Giacomo
lighthouse.
Licata from south-south-westward.
(Original dated 1936.)



Capo S. Vito from north-westward.

(Original dated 1877.)



*Monte
Inice.*

*Summit,
bearing 180°, 6 miles.*

*Capo S. Vito
lighthouse.*

Monte Monaco from northward.



*Lighthouse,
bearing 135°.*

Capo Gallo from north-westward.

(Originals dated 1936.)

CHAPTER XI

SICILY—NORTHERN AND EASTERN SIDES, WITH THE
OFF-LYING ISLANDS

Chart 170.

ISOLA D'USTICA. — Signal station. — Lights. — Dangers. —
This fertile and well-cultivated island, *see* view facing page 444, is
situated in the southern part of Mar Tirreno, *see* page 1, about
36 miles north-eastward of Capo San Vito, *see* page 429. It is of
volcanic formation, and attains at the summit of Monte Guardia dei
Turchi an elevation of about 800 feet (243^m8). From a distance west-
ward or eastward, it appears as two islets lying close to one another.
Its southern and eastern sides are free from off-lying dangers. In
many places, the coasts are steep and inaccessible.

On Monte Guardia dei Turchi stands a signal station, consisting of
a one-storied building, surmounted by a tower, painted black and
white in chequers. This signal station is connected with the general
telegraph system. Storm signals, *see* page 12, are shown.

A light is exhibited, at an elevation of 131 feet (39^m9), from a white,
circular tower, 92 feet (28^m0) in height, with a low building at its base,
situated on Punta Gavazzi, the southern extremity of the island.
See view facing page 426.

Punta dello Spalmatore, a long, sharp tongue of rock bordered by
above-water rocks, is situated about 3½ cables northward of Punta
Gavazzi, and on it is a prominent square tower.

Secca Apollo, a detached bank with a depth of about 22 fathoms
(40^m2), sand, lies about 1¼ miles west-north-westward of Punta dello
Spalmatore.

Punta di Megna lies about three-quarters of a mile north-north-
eastward of Punta dello Spalmatore. Scoglio il Medico (*Lat.* 38° 43'
N., *Long.* 13° 09' *E.*) is a large above-water rock situated about 2½ cables
north-north-eastward of Punta di Megna. There is a deep passage
between Punta di Megna and the rock, but shoal spits extend north-
ward and westward from the latter for short distances.

Secca Colombara, with a depth of 5 feet (1^m5), rock, lies about half
a mile northward of Punta Gorgo Salato, the northern extremity of
the island. The shoal is covered by the *red* sector of Punta Omo Morto
light, *see* page 428, between the bearings 120° and 161°. The tower on
Punta dello Spalmatore in line with Punta di Megna, bearing about
198°, leads about half a mile westward of this danger. The whole of

Charts 165, 676, 1440, 2158a and b.

Chart 170.

Capo Falconara, *see* below, open eastward of Punta Omo Morto, with the latter bearing about 159° , leads about $3\frac{1}{2}$ cables eastward of Secca Colombara.

- 5 Scoglio del Colombara, situated close inshore a short distance south-eastward of Punta Gorgo Salato, is a high rock resembling a stumpy tower.

A light is exhibited, at an elevation of 328 feet (100^m0), from a white tower, 23 feet (7^m0) in height, in front of a low white rectangular building, situated on Punta Omo Morto about one mile south-eastward of Punta Gorgo Salato. An auxiliary light is exhibited, at an elevation of 311 feet (94^m8), from the same tower.

- 10 Capo Falconara, the eastern extremity of the island, lies about $1\frac{1}{2}$ cables south-eastward of Punta Omo Morto, and above it, at an elevation of 511 feet (155^m7), stand the ruins of an old fort.

Cala Santa Maria lies close southward of Capo Falconara, and at its head is the village of Ustica, where there is a landing place. On a hill, 266 feet (81^m1) high, above the southern entrance point of the cove, stands Torre Santa Maria, a prominent, square tower and on another hill about one-quarter of a mile further south-south-westward is the tall, white, circular tower of a disused windmill. There is a small hospital in the village (*Lat.* $38^\circ 42' N.$, *Long.* $13^\circ 12' E.$).

Scoglio Pastizza is a pyramidal rock close inshore south-eastward of the above-mentioned windmill, but it is not easy to identify.

- 25 Punta Licciardolo, the southern extremity of the island, is a gently sloping point, situated about $1\frac{1}{4}$ miles south-westward of Scoglio Pastizza.

Anchorage.—Caution.—Anchorage can be obtained by small vessels in Cala Santa Maria, in a depth of about 4 fathoms (7^m3), sand and weed, about half a cable offshore. Larger vessels, with local knowledge, can obtain anchorage, in about 20 fathoms (36^m6), at the entrance of the cove.

- With south-westerly winds, anchorage can be obtained off the north-eastern side of the island, in a depth of about 16 fathoms (29^m3), sand and rock, about $1\frac{1}{2}$ cables offshore, with the signal station bearing 235° , and Capo Falconara just shut in by Punta Omo Morto. The anchor should be buoyed.

With south-easterly winds, anchorage can be obtained off the north-western side of the island, in about 11 fathoms (20^m1), with Scoglio il Medico bearing 265° , and the signal station bearing 133° . The bottom is rocky, and the anchor should be buoyed.

- Anchorage can also be obtained between Punta dello Spalmatore and Punta Gavazzi, in depths of about 21 fathoms (38^m4), about $1\frac{1}{2}$ cables offshore, and about $1\frac{1}{4}$ cables from the nearest shoals; care should be taken to keep Scoglio il Medico in line with or open of Punta dello Spalmatore, bearing not less than 013° . The anchor should be buoyed.

NORTHERN SIDE OF SICILY.—General remarks.—The northern coast of Sicily is in most places free from sunken dangers.

- The prevailing winds are from between south-west and north-west, and are preceded by a swell; gales, when they occur, blow home.

During fine weather, a current usually sets westward at a rate of from one-quarter to three-quarters of a knot, and is stronger inshore than in the offing; at other times the current is much influenced by the winds.

Charts 165, 676, 1440, 2158a and b.

Chart 170.

Measured distances.—Measured distances, and their marks of alignment, are indicated by pecked lines on the charts, between Palermo (page 433) and Capo d'Orlando (page 439).

Coast.—Danger.—Light.—Capo San Vito is a low, flattish point situated at the western end of the northern coast of Sicily, and is the north-western extremity of Penisola di San Vito. This cape is the eastern extremity of a flat projection, of which the western side is almost vertical, and the northern side is a steep slope. *See* views on chart 170 and facing page 427. 5

A light is exhibited, at an elevation of 144 feet (43^m9), from a white, circular tower surmounting a one-storied building, 125 feet (38^m1) in height, situated on Capo San Vito. An auxiliary light is exhibited, at an elevation of 41 feet (12^m5), from the same tower. *See* view facing page 427. 10

Torre Roccazzo is a prominent, white, one-storied building standing on the brow of the slope about half a mile south-south-westward of the lighthouse. 15

Monte Monaco rises to an elevation of 1,758 feet (535^m8), about 1½ miles south-eastward of the cape, and its sides are steep and rocky. The mountain is situated at the northern end of a ridge which descends from Monte Sparagio, 3,638 feet (1,108^m9) high, about 7 miles southward. *See* view facing page 427. 20

A shoal, with a depth of 2½ fathoms (5^m0), lies about three-quarters of a mile northward of Capo San Vito; in bad weather heavy breakers, dangerous to small vessels, are experienced off the cape; large vessels should not approach within 1½ miles. The shoal is covered by the red sector of the light at Capo San Vito, between the bearings 165° and 225°. 25

San Vito Lo Capo is a fishing village with a population, in 1950, of about 2,900, situated at the head of a small bay between Capo San Vito and Punta Solanto, the north-eastern extremity of Penisola di San Vito, about 1½ miles east-south-eastward. At the head of the bay is a sandy beach, and close westward of the village is a landing place (*Lat.* 38° 10' N., *Long.* 12° 44' E.). 30

For the coast south-westward of Capo San Vito, *see* page 408.

Golfo di Castellammare.—This large bight, along the southern and eastern shores of which runs a railway, is entered between Punta Solanto and Punta Raisi, about 16 miles eastward. At its head lies the town of Castellammare del Golfo, about 6½ miles south-eastward of which Monte Bonifato rises to an elevation of 2,710 feet (826^m0) and has a tower on its summit. 40

Punta Solanto is low and flat, and close south-south-eastward of it stands, at an elevation of 56 feet (17^m1), the high, square, half-ruined Torre dell'Usciére; about half a mile southward of the tower are the prominent white buildings, with a tall chimney, of a tunny fishery, and southward of them the shore becomes high, steep, and rocky. Tunny nets, *see* page 27, are laid out annually in the vicinity of the above-mentioned buildings. 45

Torre dell'Impiccato is a partly ruined square tower, 2½ miles south-south-eastward of Torre dell'Usciére, situated about half-way up the steep slope of a rugged rocky point. 50

Torre Scopello, square, whitish and prominent, surmounts a point, close off which are two high rocks, named Faraglioni, about 4 miles

Charts 165, 1440, 2158a and b.

Chart 170.

south-south-eastward of Torre dell'Impiccato, and on the hillside about 4 cables inland of it is a cylindrical tower ; there is a group of white buildings belonging to a tunny fishery close southward of Torre Scopello. Tunny nets, *see* page 27, are laid out annually in the vicinity of Torre Scopello, and in the vicinity of Guzzo bay about half a mile southward of Torre dell'Impiccato.

Puntazza is a somewhat salient point, of moderate elevation, about one mile south-eastward of Torre Scopello, and on the shore of Seno di Guidaloca, the small bay on its southern side, is the rectangular, grey Torre Vitalica. There is a landing place in the bay.

Cala Bianca is the cove next south-eastward of Seno di Guidaloca.

Punta La Porta, so named from a hole in it, lies about $1\frac{1}{2}$ miles east-south-eastward of Puntazza, and close off it is a detached above-water rock. About one mile south-westward of Punta La Porta, Pizzo Castellazzo rises steeply to an elevation of 784 feet (239^m0). From Punta La Porta, the shore trends about $1\frac{1}{2}$ miles south-south-eastward to Castellammare del Golfo, *see* page 431. Tunny nets, *see* page 27, are laid out annually close south-eastward of Punta La Porta.

In 1951, a breakwater was under construction extending eastward from a position about 4 cables north-westward of Castellammare del Golfo.

Between Castellammare del Golfo and the town of Balestrate, about 6 miles eastward, the shore is low and sandy and is backed by low hills.

The town of Alcamo is situated at the foot of Monte Bonifato.

Tunny nets, *see* page 27, are laid out annually off Alcamo Marina, about 3 miles westward of Balestrate.

Balestrate, a town which, in 1950, had a population of about 5,000, stands on a rocky projection, and in it there is a square belfry with a pyramidal roof.

Between Balestrate and the village of Trappeto, about 2 miles north-eastward, the coast is steep and bordered by rocks, awash, extending a short distance offshore.

A rocky shoal, with a depth of 3 fathoms (5^m5), lies about 3 cables offshore abreast Trappeto.

Capo Rama (*Lat.* 38° 08' N., *Long.* 13° 03' E.), about $4\frac{1}{2}$ miles northward of Trappeto, is a rocky projection about 100 feet (30^m5) high, and is surmounted by an old, circular, partly-ruined tower. North-eastward of Capo Rama the shore is steep and rocky.

Terrasini, a town which, in 1950, had a population of about 6,000, is situated about $1\frac{1}{2}$ miles north-eastward of Capo Rama, and close south-westward of it is a point on which is Torre Alba, high, square and crenellated.

Punta Molinazzo, about one mile northward of Terrasini, is low, rocky, and fringed with rocks, awash, extending a short distance offshore ; on it are several cottages and a large rectangular tower.

Punta Raisi lies about $1\frac{1}{2}$ miles north-eastward of Punta Molinazzo, and the shore between them is low, rocky, and fringed with rocks.

Anchorage.—Anchorage can be obtained, in a depth of about 6 $\frac{1}{2}$ fathoms (11^m9), sand, with Torre Roccazzo slightly open southward of an old tower near the beach, about one-quarter of a mile north-eastward of it, bearing about 244°, and the lighthouse at Capo San

Chart 170.

Vito bearing 330°. The holding ground is good, and the anchorage is safe except during north-easterly winds.

Anchorage can be obtained, by small vessels, with local knowledge, close inshore, between Faraglioni and Scoglio Fungo. 5

Small vessels with local knowledge can obtain anchorage in Seno di Guidaloca.

Anchorage can be obtained off Balestrate, or, in a depth of about 6 fathoms (11^m0), about 2½ cables from the sandy beach north-eastward of Trappeto (*Lat.* 38° 04' N., *Long.* 13° 02' E.). 10

There is anchorage, for vessels with local knowledge, in depths of from 10 to 11 fathoms (18^m3 to 20^m1), about 2½ cables north-westward of Terrasini. North-westerly winds are dangerous at this anchorage.

Castellammare del Golfo. — Dangers. — Light. — This town, which, in 1950, had a population of about 20,000, stands at the foot of Monte Inice, which mountain rises to an elevation of 3,491 feet (1064^m1) about 1½ miles south-south-westward of the town. On a rocky point in front of the town is an ancient castle. Dominating the town is the cathedral, and at the back of the town is a prominent church with two belfries. On the western side of the point on which stands the castle is a small mole, with a wharf on its southern side, that is only available to small craft with local knowledge; there is a 4-ton crane near the head of the mole. There is a small hospital in the town. 15 20

A light is exhibited, at an elevation of 64 feet (19^m5), from a concrete column on a square stone hut, 13 feet (4^m0) in height, situated at the castle. 25

Secca Cernia, with a depth of 3½ fathoms (6^m9), rock, lies about 4½ cables north-north-westward of the castle.

A shoal, with a rock, awash, on it, extends about one cable north-north-eastward from the head of the mole. 30

Anchorage.—Anchorage can be obtained off Castellammare del Golfo, during offshore winds, by vessels with local knowledge, in depths of 6½ fathoms (11^m9), good holding ground, westward of Secca Cernia, or in depths of about 9 fathoms (16^m5), eastward of the shoal. 35

Coast.—Three square towers, named from west to east, Torre dell' Orsa, Torre del Pozzillo, and Torre Muzza, stand on the coast within 2½ miles eastward of Punta Raisi. A white, isolated house stands out amongst low trees on the tower slopes of Pizzo di Mezzo south-south-eastward of Torre dell'Orsa. Torre Sciachea, grey and prominent, with a triangular pillar on its roof and surrounded by a high, grey wall, is situated about 3 miles eastward of Torre Muzza. 40

Baia di Carini is entered between the point on which stands Torre Muzza and Isola delle Femmine, about 4 miles east-north-eastward; in the middle of the bay the bottom is rocky. Carini and Capaci are towns at the foot of the hills inland of this bay. 45

Isola delle Femmine, 115 feet (35^m0) high, is surmounted by an old square tower. It is connected by a shoal flat with Punta de Passaggio south-south-eastward of it, on which stands a cylindrical tower.

Close south-eastward of the point is the village of Isola delle Femmine, where there is a landing place. A small mole forming a harbour at Isola delle Femmine was partially destroyed in 1945. 50

Anchorage.—Anchorage, according to the direction of the wind, can be obtained, by vessels with local knowledge, either south-eastward

Charts 165, 1440, 2158a and b.

Chart 170.

of Torre Muzza, or in the eastern part of Baia di Carini; in both places the bottom is sand.

Anchorage, sheltered from winds between south-east and west, can be obtained by vessels with local knowledge, off the village of Isola delle Femmine.

Chart 169.

Coast. — Light. — Signal station. — Storm signals. — At the village of Serracavallo, about 2 miles south-eastward of Isola delle Femmine, *see* chart 170, there is a cove. This cove is protected north-eastward by Punta di Barcarello, a low, salient, rocky point; its sides are rocky, but there is a short sandy beach at its head.

Capo Gallo, the northern extremity of the mountainous promontory of Monte Gallo, lies about $1\frac{1}{2}$ miles east-north-eastward of Punta di Barcarello. *See* views facing pages 427 and 428.

A light (*Lat.* $38^{\circ} 13' N.$, *Long.* $13^{\circ} 19' E.$) is exhibited, at an elevation of 133 feet (40^m5), from a white, circular tower, 25 feet (7^m6) in height, in front of a low white building, situated on Capo Gallo. *See* view facing page 448.

A signal station, consisting of a one-storied building surmounted by a turret, painted black and white in chequers, is situated on Monte Gallo, at an elevation of 1,729 feet (527^m0), about 3 cables south-westward of the lighthouse. Storm signals, *see* page 12, are shown.

Punta di Mondello is a rocky point, with an old tower on it, about one mile south-eastward of Capo Gallo, and about midway between them are the ruins of a small breakwater and some buildings.

Baia di Mondello is entered between Punta di Mondello and Punta Celèsi, about one mile south-eastward. This bay is shoal and has a sandy beach at its head, on the northern end of which lies the village of Mondello, in which stands Torre di Mondello, a prominent but dilapidated tower, near which are some buildings and a landing place. A bathing establishment, which is a good mark, stands amidst villas in the middle of the beach at the head of the bay. On Punta Celèsi there is a building near which a small mole projects. A rock, with a depth of 6 feet (1^m8), lies $1\frac{1}{2}$ cables offshore, about $2\frac{1}{2}$ cables east-south-eastward of Torre di Mondello. Tunny nets, *see* page 27, are laid out annually in Baia di Mondello.

Punta La Barbera lies about one mile east-south-eastward of Punta Celèsi and between them is the prominent, crenellated, reddish, cylindrical Torre Allauro, with some buildings near it. On the shore, north-eastward of the tower, are other conspicuous buildings near which is a small dilapidated mole.

Anchorage.—Caution.—Anchorage can be obtained in the cove at Serracavallo, the bottom being sand in some places, and in others weed, in depths of $3\frac{3}{4}$ fathoms (6^m9).

Anchorage can be obtained in Baia di Mondello, in depths of from 8 to 10 fathoms (14^m6 to 18^m3); but the bottom, in places, is rocky, and a better berth is, in depths of from $3\frac{1}{2}$ to 8 fathoms (5^m9 to 14^m6), sand, north-north-eastward of Punta Celèsi.

Chart 170.

Off-lying bank.—Secca la Barra, a sandy coral bank, with depths of from 43 to 47 fathoms (78^m6 to 86^m0), lies about $4\frac{1}{2}$ miles north-eastward of Capo Gallo.

Charts 165, 1440, 2158a and b.

Chart 169.

GOLFO DI PALERMO.—Light.—This light is entered between Punta La Barbera and Capo Mongerbino, about $8\frac{1}{2}$ miles south-eastward, and in it lies Porto di Palermo. Its shores are backed by mountains, the fertile cultivated slopes of which are known as Conca d'Oro. 5

Monte Pellegrino, steep, barren, and of a dark reddish colour, rises to an elevation of 1,988 feet (605^m9) above Punta La Barbera and the shore in its vicinity; near its summit, at an elevation of 1,969 feet (600^m1), is a disused signal station. On the eastern side of the mountain, at an elevation of 1,503 feet (458^m1), is a large and prominent statue, flanked by two reddish-coloured, half-ruined shrines, one on either side, with a small, ruined, cylindrical tower, named Torre del Rotolo, on the shore north-eastward of it. On the shore south-eastward of the mountain lies Punta Arenella on which stands Torre Arenella, with a group of buildings behind it, midway between which and Torre Rotolo is the small village of Vergine Maria. 15

A light is exhibited, at an elevation of 79 feet (24^m1), from Torre Arenella, a white, circular, masonry tower, 59 feet (18^m0) in height. This tower must not be confused with the tower near the middle of the northern mole at Palermo, *see* page 434. Close southward of Torre Arenella (*Lat.* $38^\circ 09' N.$, *Long.* $13^\circ 23' E.$) is a cove protected by a small mole. Castello Utveggi, a conspicuous, red building, lies about one mile westward of Torre Arenella. 20

The shore eastward of Palermo is fertile and cultivated. Near the middle of this stretch of coast, about $4\frac{1}{2}$ miles south-eastward of Torre Arenella, is Punta del Corsaro, a rocky point surmounted by a square tower, with a white vertical stripe on its northern side. 25

The town of Bagheria, which, in 1950, had a population of about 22,000, lies about $1\frac{1}{2}$ miles inland, 4 miles east-south-eastward of Punta del Corsaro, and in it are several prominent buildings. On the shore northward of Bagheria lies the village of Aspra, in which stands a high, slender square belfry. 30

Two above-water rocks lie close off Capo Mongerbino, the north-western extremity of the promontory formed by Monte Montalfano (Catalfano). *See* view facing page 445. 35

Anchorage.—Anchorage can be obtained, in depths of 9 or 10 fathoms (16^m5 or 18^m3), good holding ground, anywhere between Torre del Corsaro and the village of Aspra.

Measured distance.—There is a measured distance of 6,080 feet ($1,853^m2$) in the vicinity of Punta La Barbera. The northern end is indicated by the alignment of two red and black beacons; the southern end by a similar beacon in line with a red and black mark painted on a wall. The course to be steered is 156° or 336° . In 1947, the beacons indicating this measured distance were not in position. For other measured distances in this vicinity, *see* page 429. 45

Porto di Palermo.—This harbour, *see* view on chart 169, may be identified by the prominent mountains surrounding it, of which Monte Gallo and Monte Pellegrino have already been described. Monte Cuccio, with a small church on its bare conical summit, is 3,400 feet ($1,036^m3$) high, and rises westward of the city. On the level summit of a mountain about 2 miles southward of Monte Cuccio, at an elevation of 2,513 feet (766^m0), stands Il Castellaccio di Monreale; about three-quarters of a mile eastward of this last-named mountain are the white 50

Charts 170, 165, 1440, 2158a and b.

Chart 169.

houses of Monreale. In the city the following are prominent objects :—
The dark dome of the theatre in the centre of the city ; the black cupola of the cathedral, close northward of the theatre ; and a crane
5 in the naval dockyard. Montagna Grande rises to an elevation of 2,116 feet (645^m0) about 4½ miles south-eastward of the city.

Chart 169, plan of Port of Palermo.

The harbour is protected by three moles, Molo Nord, Diga Foranea, and Molo Sud, the northern part of Diga Foranea being joined to Molo
10 Nord by a short transverse mole. Except in its north-western part, the harbour is available to vessels up to 590 feet (179^m8) in length and drawing up to 29½ feet (9^m0). There is a tower, about 67 feet (20^m4) in height, near the middle of Molo Nord ; the signal station is established in the buildings at the base of this tower. A look-out tower,
15 92 feet (28^m6) in height, stands near the northern corner of Molo Trapezoidale. In 1949, foul ground due to wreckage, the limits of which are indicated by pecked lines on the plan, existed off the eastern and southern sides of Molo Trapezoidale.

Porticciolo di S. Erasmo is a small boat harbour, protected by the
20 remains of two breakwaters, now awash, about half a mile south-south-eastward of the root of Molo Sud.

In 1949, work was in progress reclaiming the foreshore between Molo Sud and Porticciolo di S. Erasmo.

Lights.—**Buoyage.**—A light is exhibited, at an elevation of 33 feet
25 (10^m1), from a circular concrete tower painted black and white in horizontal bands, 23 feet (7^m0) in height, situated on the southern end of Diga Foranea.

A light is exhibited, at an elevation of 31 feet (9^m4), from a conical tower and hut, 21 feet (6^m4) in height, situated on the head of Molo Sud.

30 A light (*Lat.* 38° 08' N., *Long.* 13° 27' E.) is exhibited, at an elevation of 21 feet (6^m4), from a masonry column on a circular tower, 13 feet (4^m0) in height, situated on the head of Molo Nord.

Two lights, disposed vertically, are exhibited from the north-eastern corner of Molo Trapezoidale and from the heads of each of the four
35 piers projecting from the western side of the harbour.

Three black conical buoys, surmounted by cones, mark the edge of a shoal bank extending from Molo Trapezoidale in the southern part of the harbour. There are two warping buoys close southward of Pontile Ferroviario.

40 **Anchorage.**—Open anchorage, with good holding ground, can be obtained as convenient off the harbour. Landing can be effected at steps on Foro Italico, southward of the root of Molo Sud.

Pilotage.—Pilotage is compulsory, *see* page 20. The pilot station is situated on Molo Nord. Pilots will meet vessels about one mile from
45 the entrance in response to the usual signals.

City. — **Port facilities.** — **Communications.** — Palermo (*Lat.* 38° 07' N., *Long.* 13° 22' E.) is the capital of Sicily. A British Consular officer resides here. The principal exports are agricultural produce, fish, sulphur, etc. In 1950, the population was 476,274.

50 Provisions can be procured. Water is laid on to the quays or can be supplied in tank-vessels ; notice should be given if a large quantity is required. Supplies of coal, fuel oil and diesel oil can be arranged.

Repairs can be executed. There is a dry dock on the north-eastern corner of the harbour ; *see* page 486. Several small patent slips are

Charts 170, 165, 1440, 2158a and b.

Chart 169, plan of Port of Palermo.

available. The services of a diver can be secured. There are numerous cranes, the largest of 15 tons capacity.

There are several hospitals. The health office is near the head of Molo Nord. For deratisation, *see* page 23.

Regular steamer communication is maintained with the principal ports in Italy, and also with those in other European countries and on the northern coast of Africa, and with North American ports. There is air communication with Catania, Milano, Napoli, Pantelleria, Rome, Trapani and Tunis.

Climatic table.—*See* page 59.

Chart 169.

COAST.—Dangers.—Lights.—From Capo Mongerbino, the coast trends about $1\frac{1}{2}$ miles east-south-eastward to Capo Zaffarano, and is rocky, steep and free from dangers.

Capo Zaffarano rises to a rocky, conical hill 732 feet (223^m1) high, which, from north-westward and south-eastward, appears as an island, for the land between it and Monte Montalfano, south-westward of it, is low. Close off the north-eastern extremity of the cape there is an islet, 20 feet (6^m1) high.

A light is exhibited, at an elevation of 112 feet (34^m1), from a white, octagonal tower, attached to a white building, situated on Capo Zaffarano. An auxiliary light is exhibited, at an elevation of 93 feet (28^m3), from the same light-tower. *See* view facing page 448.

From Capo Zaffarano the coast trends about 2 miles southward to Capo Grosso, and is fringed with rocks and shoals extending a short distance offshore. Half-way between these two capes are the villages of Santa Elia and Porticello. Tunny nets, *see* page 27, are laid out annually in the vicinity of Santa Elia.

A light is exhibited, at an elevation of 33 feet (10^m1), from an iron, framework structure, 21 feet (6^m4) in height, situated on the head of a small mole, that extends southward from the coast near the southern end of Porticello (*Lat.* 38° 05' N., *Long.* 13° 32' E.).

Secca di Chianca, with a depth of $4\frac{1}{2}$ fathoms (8^m7), rock, lies about one mile south-eastward of Capo Zaffarano.

Scoglio Formica is awash and lies on a small shoal about one mile eastward of Porticello.

Both the above rocks are covered by the *red* sector of Capo Zaffarano light between the bearings 298° and 344°.

Capo Grosso is surmounted by a castle which stands in the little village of Solanto. Tunny nets, *see* page 27, are laid out annually off Capo Grosso.

Porto di Spagna is a small bay on the southern side of Capo Grosso.

Anchorages.—Anchorage, sheltered from north-westerly winds, could be obtained in Seno di Santa Elia, the bay northward of the village of Santa Elia.

Porto di Spagna affords anchorage to vessels with local knowledge, in its centre, in a depth of from 7 to 8 fathoms (12^m8 to 14^m6), mud and sand.

Chart 170.

Coast.—From the head of Porto di Spagna, the coast trends about 9 miles south-eastward to Termini Imerese.

The town of Casteldaccia, which, in 1950, had a population of about

Charts 165, 1440, 2158a and b.

Chart 170.

4,700, is visible from seaward, and stands at an elevation of about 260 feet (79^m8), about 1½ miles south-south-westward of Capo Grosso ; in it is a large grey church.

- 5 The village of Altavilla Milicia, about one mile south-eastward of Casteldaccia, stands on the brow of a flat-topped hill covered with olive trees, at an elevation of about 230 feet (70^m1) ; it has a church facing the sea.

- Punta Mandra, about 2½ miles south-eastward of Altavilla Milicia, 10 is surmounted by a prominent square tower close behind which is a large fissure. Tunny nets, *see* page 27, are laid out annually in the vicinity of Punta Mandra.

- San Nicolo l'Arena is a small village in front of which stands a remarkable cylindrical tower, situated about one mile south-eastward 15 of Punta Mandra, and about three-quarters of a mile further south-eastward is a cemetery.

- The town of Trabia, which, in 1950, had a population of about 6,000, is situated on the coast about 2½ miles south-eastward of San Nicolo l'Arena ; it stands at the foot of Monte Rosamarina, which 20 latter rises to an elevation of 1,770 feet (539^m5) about 1½ miles southward of it. Near the coast in front of the village, is an old square, crenellated fortress with a tower. Tunny nets, *see* page 27, are laid out annually in the vicinity of Trabia.

- Pizzo di Cane, *see* view facing page 445, rises to an elevation of 25 3,730 feet (1,136^m9), about 5 miles south-westward of Trabia. It may be identified by two notches in its western side.

Anchorage.—Open anchorage can be obtained, by vessels with local knowledge, off San Nicolo l'Arena ; the holding ground is good and landing can be effected close eastward of the tower.

- 30 Open anchorage can be obtained, by vessels with local knowledge, off Trabia ; the bottom is sand, but depths of 2½ fathoms (5^m0) are found some distance offshore in places.

Chart 170, plan of Termini Imerese.

- Termini Imerese.**—**Danger.**—**Buoyage.**—**Lights.**—This town, 35 which, in 1950, had a population of about 23,000, stands on the eastern slope of a hill, and on its northern side is a spur of the hill which partially hides it from that direction. At the northern end of the town stands the grey cathedral with a belfry ; the belfry of San Giovanni, without a church, stands in the western part of the town ; 40 the high, square, yellowish belfry, with a cupola, of Chiesa della Gancia, dominates the houses in the high part of the town ; a large white convent is situated in the southern part of the town, and close south-eastward of it is a large, red building of several stories ; two high brick chimneys stand near the root of the mole ; and south-eastward 45 of the town is the church of Santa Maria della Catena, without a belfry.

- The harbour (*Lat.* 37° 59' N., *Long.* 13° 42' E.), which is liable to silting, is formed by a breakwater, which projects about three-quarters of a mile eastward from the coast at the northern end of the town. 50 Secca San Giovanni, with depths of less than 16 feet (4^m9), extends about 2 cables south-eastward of the head of the breakwater. The southern-eastern and southern sides of this shoal are marked by black conical buoys, which are surmounted by black cones. Secca San Giovanni is covered by the *red* sector of the light on the southern

Charts 165, 1440, 2158a and b.

Chart 170, plan of Termini Imerese.

side of the harbour (*see below*) between the bearings of 163° and 185° .

A light is exhibited, at an elevation of 39 feet (11^m9), from a masonry tower, 25 feet (7^m6) in height, situated on the head of the breakwater. 5

A light is exhibited, at an elevation of 39 feet (11^m9), from a concrete column on a small stone tower, 20 feet (6^m1) in height, situated on the southern side of the harbour.

A light is exhibited, at an elevation of 28 feet (8^m5), from a concrete column, 13 feet (4^m0), in height, situated near the root of the break- 10 water.

Near the root of the breakwater is a pier, alongside the head of which there are depths of about 20 feet (6^m1) ; about one cable south-south-westward of the head of the pier and half a cable offshore are some rocks, just above water. In the north-western part of the 15 harbour there are a number of mooring and warping buoys.

Anchorage.—Open anchorage can be obtained anywhere off the harbour, but the holding ground of soft mud is not good.

Port facilities.—There is a small hospital at Termini Imerese. Minor repairs can be executed. Fresh provisions are obtainable. 20 Water is laid on to the quays. A small stock of coal is available. There is a 2-ton crane near the root of the breakwater.

A pilot, *see* page 20, is available.

Chart 170.

Coast.—Monte Santo Calogero, the slopes of which are covered with 25 olive groves, and the summit of which appears on certain bearings as two peaks, is a prominent landmark, and rises to an elevation of 4,347 feet ($1,325^m0$) about 3 miles south-south-eastward of Termini Imerese. *See* view facing page 448.

Fiume Torto flows into the sea about 3 miles eastward of Termini 30 Imerese, and is spanned by an iron bridge which is visible from seaward ; at a short distance from its mouth are two large buildings.

Torre Battilmano, low and square, stands on the coast about 2 miles eastward of the mouth of Fiume Torto, and close eastward of it the mouth of Fiumara Grande is spanned by a masonry bridge. 35

Torre Roccella (*Lat. $38^{\circ} 00' N.$, Long. $13^{\circ} 53' E.$*), close southward of which the village of Campofelice surmounts a flat green spur of the mountains, stands on the coast about 4 miles east-north-eastward of Torre Battilmano, and is a high square building with a ruin in front 40 of it.

Anchorage.—Open anchorage can be obtained according to draught off the beaches on either side of the mouth of Fiume Torto ; the bottom everywhere is sand.

Charts 170 and 188.

Coast.—Light.—Capo Plaia, about $3\frac{1}{2}$ miles north-eastward of 45 Torre Roccella, is a low, flat, rocky point, covered with olive trees.

Torre Santa Lucia, circular and dismantled, surmounts a rocky point, about $2\frac{1}{2}$ miles eastward of Punta Plaia, and close eastward of it is a white chapel. Between Torre Santa Lucia and Capo Cefalù, about $1\frac{1}{2}$ miles eastward, are two shoals, with depths of from 6 to 50 10 feet (1^m8 to 3^m0), within $2\frac{1}{2}$ cables of the coast.

Capo Cefalù is the low rocky extremity of a slight projection which rises to a remarkable conical hill, 882 feet (268^m8) high and surmounted by the ruins of a castle.

Charts 165, 1440, 2158a and b.

Charts 170 and 188.

A light is exhibited, at an elevation of 262 feet (79^m9), from a white octagonal tower on a two-storied white building, 85 feet (25^m9) in height, situated on Capo Cefalù. At a short distance northward of the lighthouse is a chapel. *See* view facing page 449.

The town of Cefalù, which, in 1950, had a population of about 10,000, stands on the western side of the above-mentioned conical hill, and in it is a prominent cathedral. Landing is effected at a small mole. There is a hospital in the town. A local pilot is available.

- 10 **Anchorage.**—Anchorage can be obtained, half a mile offshore, between Torre Santa Lucia and Capo Cefalù, in depths not less than 5½ fathoms (10^m1). Small craft, with local knowledge, can approach closer to the town.

Chart 188.

- 15 **Coast.**—Torre Caldura, square and partly demolished, surmounts a rocky point about half a mile south-eastward of Capo Cefalù, and on its north-western side is Insenatura di Presidiana, that affords shelter to small craft, with local knowledge, during south-westerly winds.

From Torre Caldura, the coast trends about 5 miles eastward to Punta Finale, and is backed by mountains. Off the mouths of the valleys between the mountains heavy squalls are experienced during southerly winds.

- 20 Punta Finale (*Lat.* 38° 02' N., *Long.* 14° 09' E.) is moderately high and has reddish rocky sides. Above the point stand three towers and a small village.

The village of Pollina stands on a mountain 2,500 feet (762^m0) high, about 2½ miles southward of Punta Finale, and shows up well from seaward; close westward of the houses stands a prominent tower. *See* view facing page 449.

- 30 Castel di Tusa, a village fronted by the ruins of a castle, is situated on the coast about 5 miles eastward of Punta Finale, and is a prominent mark, and between them is the mouth of Fiume di Pollina, spanned by a masonry bridge of five arches. The town of Tusa, which, in 1950, had a population of about 4,700, stands about 1½ miles southward of Castel di Tusa, on a mountain, about 2,000 feet (609^m6) high, and is very prominent from seaward. Tunny nets, *see* page 27, are laid out annually about 2 miles westward of Castel di Tusa.

- Torremuzza (Mozza tower), about 3½ miles eastward of Castel di Tusa, is a square tower with a group of houses close to it and a factory with a very tall chimney at a short distance eastward of it. Between the village and the tower, Fiume di Tusa, the mouth of which is spanned by a masonry bridge, flows into the sea. The village of Motta d'Affermo stands, at an elevation of about 2,300 feet (701^m0), about 2 miles south-south-westward of Torremuzza, and is visible from seaward.

- Castello di Mistretta stands on the summit of a conical mountain, 3,231 feet (984^m8) high, at the head of the valley of Fiume di San Stefano, the mouth of which river is spanned by two bridges and flows into the sea about one mile eastward of Torremuzza. Between Castello di Mistretta and Torremuzza is the village of Reitano, about 1½ miles eastward of which is a very prominent chapel, named S. Croce di San Stefano, which is a good mark.

The town of San Stefano di Camastra, which, 1950, had a population of 5,700, is situated, close eastward of the mouth of Fiume di San

Charts 1976, 165, 1440, 2158a and b.

Chart 188.

Stefano, on a small hill covered with olive trees and vines. About one mile eastward of the town is a refinery with a square chimney.

Punta Caronia, about 4 miles eastward of San Stefano di Camastra, is a low, white, rounded projection, through which Fiume di Caronia, the mouth of which is spanned by two bridges, flows into the sea. Close eastward of the mouth of this river, the town of Caronia, which, in 1950, had a population of about 5,000 and a remarkable castle, stands on a low hill. 5

Torrente Furiano, the mouth of which is spanned by two masonry bridges, flows into the sea about $6\frac{1}{2}$ miles eastward of Punta Caronia, and the coast between is fringed with rocks, some of which are large and plainly visible. Torre del Lauro, about $1\frac{1}{2}$ miles south-westward of the mouth of the river, is small and is backed by a rectangular building. 10

The town of San Fratello, in the middle of which is a cathedral with a belfry, is situated about 3 miles south-south-eastward of the mouth of Torrente Furiano; it is visible from westward, but is hidden by the Monte San Fratello, 2,346 feet (715^m1) high, when bearing more than 135°. In 1950, it had a population of about 8,000. 15

The village of Acquedolci stands on the coast about $1\frac{1}{2}$ miles eastward of the mouth of Torrente Furiano, and in it is a large church with a belfry. At the eastern end of the village is a conspicuous castle with a square tower on its eastern side. 20

The town of Santa Agata di Militello (*Lat.* 38° 05' N., *Long.* 14° 41' E.), which, in 1950, had a population of about 10,000, stands about one mile eastward of the mouth of Torrente dell'Inganno, and about $2\frac{1}{2}$ miles east-north-eastward of the mouth of Torrente Furiano. The town is dominated by a church with a pointed belfry, and close westward of the town is a long yellow building with a tall chimney. 25

Anchorage.—Anchorage can be obtained, eastward or westward of Punta Finale or off Santa Agata di Militello, the bottom in each case being of mud and sand, good holding ground. 30

Coast.—**Light.**—The village of San Marco d'Alunzio surmounts a round-topped mountain, 1,798 feet (548^m0) high, about 3 miles eastward of Santa Agata di Militello, and is visible from seaward; near the coast at the foot of the mountain is the small village of Torrenova (Terranova). 35

Fiumara Rosmarino and Fiumara di Zappulla flow into the sea, respectively, about 2 and $5\frac{1}{2}$ miles north-eastward of the mouth of Torrente dell'Inganno, and their mouths are spanned by bridges; the first-named is liable to flooding, especially in winter, when it forms islets and banks, and on the western bank, near the mouth of the second, is the village of Zappulla. 40

An isolated, dark-red, two-storied house, with white window frames, stands about one mile south-westward of the bridge spanning the mouth of Fiumara di Zappulla. 45

Capo d'Orlando, 328 feet (100^m0) high, rugged, and conical when seen from north-westward, lies about 3 miles north-eastward of the mouth of Fiumara di Zappulla; on its summit stands a church surrounded by an old wall which gives to it the appearance, at a distance, of a castle. On the western side of the cape there is a reef, which extends about half a mile offshore, and near it there is a sandy beach on which stands a village. On a hill close southward of the cape stands 50

Charts 1976, 165, 1800, 1440, 2158a and b.

Chart 188.

a signal station, consisting of a low, yellow building surrounded by a wall, at an elevation of about 320 feet (100^m6). The cape is noted for the sudden squalls and heavy seas which are encountered near it.

- 5 A light is exhibited, at an elevation of 89 feet (27^m1), from an octagonal tower, 34 feet (10^m4) in height, in front of a low, yellow building, situated on Capo d'Orlando. See view facing page 449.

The town of Capo d'Orlando, which, in 1950, had a population of about 5,000, extends for about one mile along the beach westward of
10 the cape.

From Capo d'Orlando, the coast trends about 2 miles south-eastward and is rugged, broken and fringed with rocks and shoals, without any beach, except at San Gregorio, a small village in a cove, situated about one mile south-eastward of the cape.

- 15 The town of Naso, which, in 1950, had a population of about 5,000, and in which there is a pointed belfry, is situated on the summit of a wooded hill, about 1,640 feet (499^m9) high, about 3½ miles south-south-eastward of Capo d'Orlando. At the foot of the hill Fiume di Naso, the mouth of which is spanned by two bridges, flows into the sea.

- 20 Scoglio di Brolo (*Lat. 38° 10' N., Long. 14° 50' E.*) is a rounded rock, 46 feet (14^m0) high, lying 3 cables offshore about 3½ miles eastward of Capo d'Orlando. Near Scoglio di Brolo stands the village of Brolo in which there is a high, square, crenellated tower, and which is situated on a small, rocky eminence 148 feet (45^m1) high. Close south-west-
25 ward of Scoglio di Brolo are the bridges spanning Fiumara di Brolo.

Capo Piraino, about 1½ miles eastward of Scoglio di Brolo, is high, rugged, and fringed with shoals and rocks, awash. On a rocky projection at the foot of this headland stands Torre Ciavole, a large square tower, and a short distance inland stands a prominent cylindrical tower,
30 at an elevation of 1,365 feet (416^m0), close eastward of which is the village of Piraino.

The town of Gioiosa Marea, which, in 1950, had a population of about 7,000, stands on the coast about 2 miles eastward of Capo Piraino; about 2 miles south-eastward of it, and at an elevation of about
35 2,608 feet (794^m9), are the ruins of the old town of Gioiosa Vecchia;

Measured distances.—For measured distances, see page 429.

Anchorage.—Anchorage can be obtained, by vessels with local knowledge, close eastward or westward of Capo d'Orlando.

Anchorage can be obtained, by vessels with local knowledge, off
40 Brolo, but heavy squalls from the mountains are sometimes experienced.

In all the above-mentioned anchorages the holding ground is good, the bottom being of mud and sand.

Anchorage can be obtained, by vessels with local knowledge, off either Capo Piraino or Gioiosa Marea.

- 45 **Golfo di Patti.**—**Dangers.**—This bight is entered between Capo Calavà, about 1½ miles north-eastward of Gioiosa Marea, and Capo Milazzo, about 15 miles east-north-eastward. It is divided by Capo Tindaro, about 6½ miles south-eastward of Capo Calavà, into two bays, the western one of which is Baia di Patti, and the eastern one, Baia
50 di Oiveri.

Capo Calavà is the high, rugged, rocky extremity of a spur of Monte Pezzecalori, which latter rises to an elevation of 1,742 feet (531^m0) about one mile inland. The cape is precipitous on its northern and eastern sides, with rocks close inshore, but on its western side is a

Charts 1976, 165, 1800, 1400, 2158a and b.

Chart 188.

sandy beach. At San Giorgio, about $1\frac{1}{2}$ miles south-eastward of Capo Calavà near the mouth of Torrente Maiaro, is a large red building belonging to a tunny fishery; tunny nets, *see* page 27, are laid out in the vicinity. 5

Baia di Patti is fringed by pebbly beaches, and its shores, through which several streams discharge, are backed by hills.

Secca Formaggiara and Scoglio Gargano, the former with a depth of about 2 feet (0^m6), and the latter awash, lie within three-quarters of a cable of the shore about one mile south-eastward of San Giorgio. 10

Pietra di Patti, a brown, conical rock, 46 feet (14^m0) high, with a low rock close eastward of it, lies 6 cables offshore about $2\frac{1}{2}$ miles east-south-eastward of San Giorgio (*Lat.* 38° 10' N., *Long.* 15° 00' E.).

The town of Patti is visible from seaward and is situated, at an elevation of about 500 feet (152^m4), in a large valley at the head of 15 Baia di Patti. In 1950, it had a population of about 9,000.

The village of Marina di Patti stands on the shore about $1\frac{1}{2}$ miles south-eastward of San Giorgio, and near its western end is a red building with a tall chimney, close eastward of which is a large battlemented building. On a ridge westward of Marina di Patti are the 20 remarkable ruins of Gioiosa Vecchia, *see* page 440.

Capo Tindaro is steep, and on its eastern side are vertical cliffs, 915 feet (278^m9) high, on the top of which is a sanctuary painted red, with two pointed belfries, which shows up well from eastward, but is not visible from westward. 25

Secca di Tindaro, a shifting sandbank, fringes the cape, and extends about three-quarters of a mile eastward from it.

Baia di Oliveri has a sandy beach, free from off-lying dangers, and its shores are fertile and cultivated; into it flow numerous streams spanned by bridges. The village of Oliveri is situated about $1\frac{1}{2}$ miles 30 south-south-eastward of Capo Tindaro, and is mostly hidden by a railway embankment. In it are a castle, on a mound surrounded by trees, and a prominent building, belonging to a tunny fishery, with two tall chimneys. Tunny nets, *see* page 27, are laid out annually at the head of Baia di Oliveri and also off the mouth of Torrente 35 Mazzarra about $2\frac{1}{2}$ miles further eastward.

Falcone and Furnari are villages situated, respectively, near the shore about one mile east-south-eastward of Oliveri, and $1\frac{1}{2}$ miles inland about 2 miles further east-south-eastward; near the first-named is a factory with a tall chimney; the second stands at an elevation of 40 476 feet (145^m1).

Torre del Forte, on the shore northward of Furnari, is a square building more like a house than a tower.

The town of Castrolibero stands at an elevation of 1,312 feet (399^m9), about $3\frac{1}{2}$ miles inland and 7 miles eastward of Oliveri. About 7 miles 45 south-south westward of Castrolibero, the sharp-pointed Rocca di Novara rises to an elevation of 4,400 feet (1,341^m1).

The town of Barcellona, situated one mile inland and about 4 miles north-eastward of Torre del Forte, has a church with a remarkable cupola. In 1950, it had a population of about 13,000. 50

Anchorages.—Anchorage can be obtained, by vessels with local knowledge, in a depth of about 10 fathoms (18^m3), sand, between Pietra di Patti and the shore. There is a mooring buoy about one mile west-south-westward of Pietra di Patti.

Charts 1976, 165, 1800, 1440, 2158a and b.

Chart 188.

Anchorage can be obtained in Baia di Oliveri, the best berth being off the village of that name about one-quarter of a mile offshore, with Castello di Oliveri in line with the westernmost buildings in the village ;
 5 the bottom is good holding ground of hard mud.

Chart 175.

Penisola di Milazzo. — Light. — Dangers. — This peninsula, in most places fringed with rocks and shoals extending a short distance offshore, extends about 3 miles northward from the mainland, to
 10 which it is joined by a low, flat isthmus, and it terminates in Capo Milazzo. This peninsula is covered with olive groves and on it, surmounted by a church, is Monte Trino, 443 feet (135^m0) high, *see* views facing page 445. From eastward or westward, the peninsula appears as an island with a town and a citadel, *see* below, at its southern end.
 15 Baia di Sant' Antonio, on the western side of the northern part of the peninsula, is protected on its northern side by Punta Gamba di Donna, a point fringed with a shoal bank extending about one cable offshore.

Tunny nets, *see* page 27, are laid out annually on the western side
 20 of the peninsula southward of Punta del Tono.

Scogli della Portella, the largest of which is 30 feet (9^m1) high, lie close off the south-western extremity of Punta Gamba di Donna, and a detached 4½-fathom (8^m7) rocky patch lies about 3 cables northward of that point.

25 Capo Milazzo (*Lat.* 38° 16' N., *Long.* 15° 14' E.), the northern extremity of the peninsula, terminates westward in Punta Gamba di Donna and eastward in Punta Mazza, about 7 cables eastward, the coast between being rocky.

Punta Mazza is foul, with rocks, awash, lying about half a cable
 30 north-eastward and eastward of it. A depth of 3 fathoms (5^m5) lies one cable north-eastward of the point.

A light is exhibited at an elevation of 295 feet (89^m9), from a white circular tower, 34 feet (10^m4) in height, situated on Capo Milazzo. Close eastward of the lighthouse is a red building surmounted by a
 35 yellow turret, with a flagstaff close by.

Anchorage.—Anchorage, well protected from north-easterly and south-easterly winds, can be obtained in the middle of Baia di Sant' Antonio, in depths of about 9 fathoms (16^m5).

Baia di Milazzo.—Harbour.—Light.—From Punta Mazza, the
 40 eastern side of Penisola di Milazzo trends about 2½ miles southward to Croce di Mare, and is cliffy and fringed with rocks and shoals extending a short distance offshore.

Punta Ponte delle Scale lies about 6 cables south-south-eastward of Punta Mazza, and between the coast is fringed by a bank, with depths
 45 of less than 6 fathoms (11^m0), extending as much as 1½ cables offshore in places.

Punta Belvedere lies about one mile south-south-eastward of Punta Ponte delle Scale. A detached 4½-fathom (8^m7) patch lies about 2 cables northward of Punta Belvedere. Tunny nets, *see* page 27,
 50 are laid out annually in the vicinity of Punta Belvedere.

Croce di Mare is a group of rocks, 4 feet (1^m2) high, situated close inshore ; on one of them there is a small stone chapel. Southward of these rocks the shore becomes sandy.

The town of Milazzo, which, in 1950, had a population of about

Charts 1976, 165, 1800, 1440, 2158a and b.

Chart 175.

12,000, is situated on the western shore of the bay, southward of Croce di Mare, and is in two parts. In the upper part is the prominent citadel, with a disused church surmounted by a cupola within its walls. In the lower part, further southward are a number of mills and industrial establishments. In the middle of the lower part of the town there is a church with a silver-grey cupola, with a square white belfry with a red roof close to it. A chimney enclosed in an iron framework, 164 feet (50^m0) in height, stands about half a mile southward of the head of the mole at Milazzo and is a good mark. Vegetables, fruit, oil, wine, etc., are exported. There is a hospital in the town.

Provisions can be procured. Water is laid on to the wharves, but is scarce in summer. A small stock of coal is maintained. Minor repairs can be executed. There is a 7-ton crane.

Porto di Milazzo (*Lat.* 38° 13' N., *Long.* 15° 15' E.), situated southward of the town, is protected north-eastward by Molo Ludovico Marullo, which extends about 2½ cables south-eastward from the shore. The outer part of this mole is known as Molo Foraneo; on the inner side of the inner part of Molo Ludovico Marullo is a wharf. On the western side of the harbour are wharves, and on its south-eastern side a mole extends about three-quarters of a cable north-eastward from the shore. The harbour is open eastward and strong east-south-easterly winds render it uncomfortable.

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron, framework structure on a red masonry hut, 23 feet (7^m0) in height, situated on the head of Molo Foraneo.

In 1949, the greatest depths were about 33 feet (10^m7) in the middle of the port decreasing towards the sides, the north-eastern part being the deepest, but Molo Foraneo is fringed by a shoal bank extending a short distance from its southern side, and the remains of a wharf, with a depth of 13 feet (4^m0), lie close south-westward of the middle of Molo Ludovico Marullo. The southern part of the harbour is shoal. The holding ground in the harbour is poor. A warping buoy lies in the entrance to the harbour, and a mooring buoy, which is reserved for the mail steamer, lies in the north-western part. Pilots, *see* page 20, are available.

Torrente Floripotema flows into Baia di Milazzo about 1½ miles east-south-eastward of the harbour. Tunny nets, *see* page 27, are laid out annually in the vicinity of the mouth of the river.

Anchorage.—Anchorage can be obtained in Baia di Milazzo, outside the harbour, there being a depth of 16 fathoms (29^m3), mud and good holding ground, about 1½ cables eastward of the head of Molo Foraneo. Anchorage is prohibited, owing to the presence of submarine cables, *see* page 19, westward of an imaginary line drawn from the head of Molo Foraneo to Croce di Mare. There is a 4½-fathom shoal situated about 2½ cables offshore 6½ cables eastward of the southern mole. The anchorage is exposed to north-easterly winds, but these do not blow for long. When Isole Eolie, *see* page 445, are clearly visible from the anchorage, southerly winds may be expected, and when they are enveloped in cloud it is a sign of coming northerly winds.

Chart 3935.

Coast.—Light.—From Porto di Milazzo, the coast trends about 14 miles east-north-eastward to Capo Rasocolmo, and is low, sandy,

Charts 188, 1976, 165, 1800, 1440, 2158a and b.

Chart 3935.

well cultivated and free from off-lying dangers. Through this stretch of coast numerous streams, the mouths of which are spanned by bridges, flow into the sea.

- 5 The town of Santa Lucia del Mela, about 4 miles southward of the mouth of Torrente Floripotema, is situated at an elevation of about 1,000 feet (304^m8), and is visible from seaward when bearing less than 200°. In 1950, it had a population of about 6,000.

Between the valleys through which flow Torrente Muto and Fiumara di Nocito, about 4 miles eastward of Milazzo, a spur of the mountains descends in regular level terraces and shows up well from seaward. Farther eastward, the mountains gradually approach the coast, and on their slopes are a number of villages. The mouth of Fiumara di Nocito is spanned by a long arched bridge.

- 15 The town of Spadafora, in which there are two tall chimneys, is situated on the coast about 2½ miles eastward of the mouth of Fiumara di Nocito. In 1950, it had a population of about 4,000. A high, reddish building, with a red roof, and surrounded by a white wall, stands on the beach westward of Spadafora.

- 20 Fiumara Saponara (*Lat. 38° 14' N., Long. 15° 26' E.*) flows into the sea about 2 miles eastward of Spadafora, and its mouth is spanned by a remarkable bridge with many arches.

The town of Gesso stands on a hill, 869 feet (264^m9) high, about 1½ miles inland and 2½ miles eastward of the mouth of Fiumara Saponara. In it stands a large church with a square belfry. The population was about 8,000, in 1950.

- Capo Rasocolmo is the termination of a fertile and cultivated tableland, about 250 feet (76^m3) high, which descends in a steep rocky slope, against the lower part of which there is a remarkable accumulation of sand fronted by a sandy beach. *See view facing page 449.*

A light is exhibited, at an elevation of 253 feet (77^m1), from a white, circular, iron tower on a white masonry hut, 20 feet (6^m1) in height, attached to a rectangular tower, situated on Capo Rasocolmo.

- Anchorage.**—Temporary anchorage could be obtained off Spadafora in a depth of 11 fathoms (20^m1), mud and sand, about 4½ cables offshore.

Chart 177.

- Coast.—Dangers.**—From Capo Rasocolmo, the coast trends about 6½ miles east-south-eastward to Capo Peloro, *see page 455*, and consists of a sandy beach backed by hills. In it are the mouths of Fiumara Lavina and Fiumara dei Corsari, each spanned by a bridge.

Secca Rasocolmo, with depths of less than 6 fathoms (11^m0), fringes this stretch of coast, and in the vicinity of the mouth of Fiumara dei Corsari extends as much as 1½ miles offshore. It is covered by the *red* sector of the auxiliary light at Capo Peloro bearing less than 127°, and Capo Rasocolmo light is obscured over it when bearing more than 225°. A vessel passing the shoal, from west to east, should keep the whole of Penisola di Milazzo well open northward of Capo Rasocolmo until Torre Cavallo, *see page 455*, is in line with the lighthouse at Capo Peloro, bearing 132°, which leads nearly half a mile north-eastward of its edge.

In 1943, an obstruction was reported northward of Capo Peloro; *see page 455.*

Charts 188, 1976, 198, 165, 1800, 1440, 2158a and b.

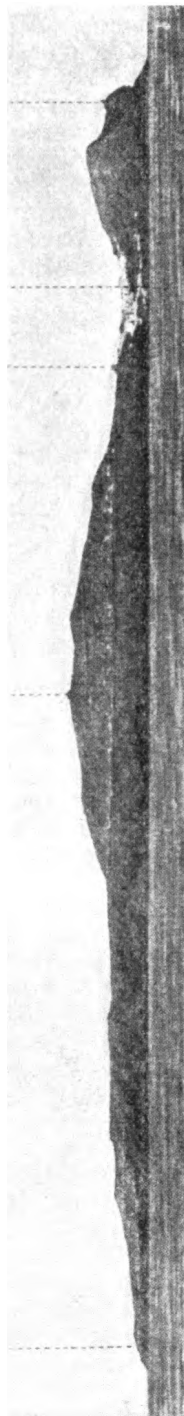


*Monte
Pellegrino.*

*Capo Gallo
signal station.*

*Isola delle
Femmine.*

Capo Gallo from north-eastward, distant 8 miles.



*Punta
Licciardolo.*

*Monte Guardia
des Turchi signal
station, bearing
310°, 2½ miles.*

*Torre
S. Maria. S. Maria.*

*Punta
Ono Morto
lighthouse.*

Isola d'Ustica from south-eastward.



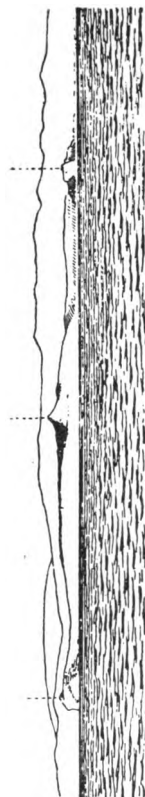
*La
Canna. Scoglio
Montenassari.*

*Monte Fossa Felci.
bearing 080°, 5½ miles.*

Isola Filicudi from westward.

(Originals dated 1898.)

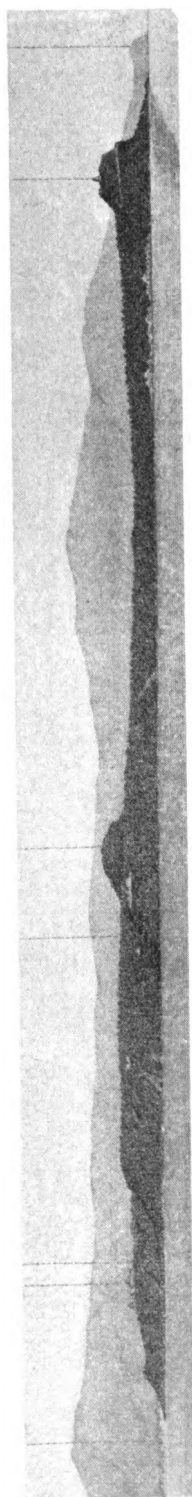
*Isola Salina.
Capo Gratiato.*



Lighthouse,
bearing 80° , 11 miles.
Capo Milazzo from westward.
(Original dated 1936.)

Monte
Irino.

Castello.



Milazzo.
Citadel.
Punta
Belvedere.

Monte
Irino.

Penisola di Milazzo from east-north-eastward.
(Original dated 1877.)

Capo Milazzo
lighthouse, bearing 201°



Capo Zaffirano.
Capo Mongerbino from north-westward.
(Original dated 1936.)

Monte Catalano,
bearing 158° , 9 miles.

Bageria
Pizzo di Cane.

Chart 172.

ISOLE EOLIE.—**General remarks.**—**Caution.**—These islands, also known as Isole Lipari, lie within 35 miles of the eastern part of the northern coast of Sicily, *see* chart 1976 and view A on chart 172. This group consists of seven principal islands, namely, Alicudi, Filicudi, 5 Salina, Lipari, Vulcano, Panarea, and Stromboli, together with several islets and rocks, all of volcanic formation. Generally high, steep-sided, and rocky, the islands contain large craters at considerable elevations, the volcanoes in Isola Vulcano and Isola Stromboli being still active.

The islands are fertile and well cultivated, and pumice stone is the 10 most important product.

During the months of April, May, and June, long-net fishing takes place eastward of Isola Lipari and Isola Vulcano, between the parallels of latitude 38° 22' N. and 38° 32' N., and within 5 miles of their coasts. During the fishing season, therefore, this area should be avoided. 15

From 15th April to 15th July, annually, fishing takes place on a large scale in an area north-eastward of Isola Stromboli. Vessels should therefore, during this period, pass not less than 5 miles eastward of Strombolicchio light-structure (page 454). *See* page 27.

Isola Alicudi.—Isola Alicudi, the westernmost of the group, is 20 situated about 29 miles north-westward of Capo d'Orlando, *see* chart 1976. It is a rounded cone, and, at the summit of Montagnole, attains an elevation of 2,185 feet (666^m0). The volcano is no longer active, and its crater is almost inaccessible. The south-eastern coast of the island is steep-to. *See* view facing page 461. In 1950, the population 25 was about 750.

Scoglio Galera (*Lat.* 38° 33' N., *Long.* 14° 20' E.) is a low, blackish rock lying close off the middle of the western side of the island.

The western side of the island is barren and deserted, the principal buildings being on its eastern side; on this latter side are Punta 30 Palomba and Punta Fucile, and about three-quarters of a mile northward of the last-named is Punta Bazzina.

Anchorage.—Temporary anchorage can be obtained, by small vessels with local knowledge, off the coast between Punta Palomba and Punta Facile, or near Punta Bazzina, in depths of from 14 to 16 fathoms 35 (25^m6 to 29^m3), about half a cable offshore. Better anchorage can be obtained, southward of Scoglio Galera, in a depth of from 17 to 19 fathoms (31^m1 to 34^m7), about 1½ cables offshore.

Isola Filicudi.—**Dangers.**—Isola Filicudi lies about 8½ miles east-north-eastward of Isola Alicudi; it is partly cultivated. It 40 attains at the summit of Monte Fossa Felci an elevation of 2,542 feet (774^m8); *see* view facing page 444. In 1950, the population was about 1,000.

Punta del Perciato, westward of Monte Fossa Felci, has several natural arches in it. The north-western and northern sides of the 45 island are mostly high and are fringed with above-water rocks, one of which is noticeable.

A detached shoal, with a depth of 3½ fathoms (5^m9), rock, lies about 3 cables offshore near the middle of the northern side of the island. 50

Punta dello Zucco Grande, the north-eastern extremity of the island, is steep, and on the slopes above it are vineyards.

Capo Graziano is the south-eastern extremity of the island, and of a reddish, rocky peninsula with a rounded summit, 571 feet (174^m0) high,

Charts 188, 1976, 165, 1800, 1440, 2158a and b.

Chart 172.

which is connected with the island by a low cultivated isthmus. Close off its eastern side is a rock with a depth of $1\frac{1}{2}$ fathoms (2^m3).

Punta Stimpagnato is the south-western extremity of the island, and at a short distance eastward of it lies the village of Pecorini, the church in which has a pointed spire.

Off-lying islets and bank.—A group of rocks lies about 7 cables off the north-western coast of Isola Filicudi. La Canna, the most noticeable, is about 230 feet (70^m1) high and shaped like an obelisk. Scoglio Montenassari, a low blackish rock, lies between La Canna and the island. Other smaller rocks lie between these two rocks and extend southward of them. The channel between this group of rocks and the island is half a mile wide and clear of dangers.

Secca di Filicudi, with a depth of 21 fathoms (38^m4), is a small detached bank lying about one mile north-westward of La Canna.

Anchorage.—Anchorage can be obtained, by small vessels with local knowledge, north-eastward or south-westward of the isthmus of Capo Graziano. Anchorage can also be obtained eastward of Punta Stimpagnato, off some houses under the church of Pecorini. The bottom is everywhere sandy.

Isola Salina.—**Danger.**—**Lights.**—This island lies about $9\frac{1}{2}$ miles eastward of Isola Filicudi, and there are two volcanoes on it, Monte dei Porri, 2,818 feet (858^m9) high, and Monte Fossa della Felci, 3,156 feet (961^m9) high, which are connected by a low flat ridge. See view facing page 449. In 1950, the population was about 3,700.

On the northern side, eastward of Malfa, the land exudes vapour, and close off the southern side, off Rinella, there are intermittent submarine discharges of sulphuretted hydrogen. In the island are several fertile valleys and plains, and its coasts are in most places steep-to and free from off-lying dangers. Wine, grapes, capers, oil, and currants are produced.

Punta Valle la Spina is the western extremity of the island, and about half a mile and $1\frac{1}{2}$ miles north-north-eastward of it, respectively, are Punta Frontone and Punta del Perciato. Except close southward of Punta del Perciato, this part of the coast is high and inaccessible, and between the two last-mentioned points lies the village of Pollara, in which there is a large grey church.

Faraglione di Pollara (*Lat. $38^\circ 35' N.$, Long. $14^\circ 48' E.$*) is a large, rounded rock, situated about 4 cables south-westward Punta del Perciato, that is joined to the coast by a reef; another reef extends about one cable north-westward of it.

Punta del Perciato is steep-sided and has a hole in it that is noticeable from north-eastward and south-westward. On the point stands a yellow one-storied building surmounted by an octagonal turret.

Malfa is a village, about $1\frac{1}{2}$ miles eastward of Punta del Perciato; in it there is a small hospital and a prominent church; there is a small mole, alongside which small craft can berth, close westward of which are the ruins of a breakwater.

Three rocky shoals, with depths of 5 feet (1^m5), $2\frac{1}{2}$ fathoms (4^m1) and $3\frac{1}{2}$ fathoms (5^m9), lie, respectively, about $1\frac{1}{2}$ cables north-eastward, three-quarters of a cable north-eastward and half a cable east-north-eastward of the head of the mole.

Capo Faro is the north-eastern extremity of the island, and between

Charts 1976, 165, 1800, 1440, 2158a and b.

Chart 172.

it and Malfa the coast is steep, rocky and fronted by above-water rocks; along this stretch of coast stand two churches.

A light is exhibited, at an elevation of 174 feet (53^m0), from an octagonal tower, 31 feet (9^m4) in height, in front of a low yellow building situated on Capo Faro. There are some houses and a landing place near the lighthouse.

Santa Marina Salina, the principal village in the island, lies about 1½ miles southward of Capo Faro, and in it there is a prominent, dark grey church with a large cupola; a smaller, bright yellow church, with two pointed belfries is situated near the coast southward of the dark grey church. Landing can be effected at a small mole protected by a breakwater. At a short distance northward of the village is Scali Barone, near the mouth of the stream of the same name.

Punta Lingua, the south-eastern extremity of the island, is low and on it is a saltpan; it is fringed by a shoal bank extending about 2 cables offshore, and is fronted by a shifting beach of pebbles. Near the point is the village of Lingua, in which stands a yellow church.

A light is exhibited, at an elevation of 34 feet (10^m4), from a grey, iron, framework structure surmounting a low, white building, 28 feet (8^m5) in height, situated on Punta Lingua. See view facing page 452.

Punta Grottazzo (*Lat.* 38° 32' N., *Long.* 14° 51' E.), the southern extremity of the island, is steep and rocky.

Rinella is a village at the seaward end of the cultivated valley of Vallonazzo, near the middle of the south-western coast of Isola Salina, and above it is the village of Leni, in each of which villages stands a prominent church, with a belfry. At Rinella is a small sandy beach with a landing place, and near it are some caves, in which the fishermen's boats are kept.

Scoglio dell'Ariana is a reef, almost awash, on which the sea breaks, situated within three-quarters of a cable of the shore at the western end of Rinella.

Off-lying danger.—Caution.—Secca del Capo, with a depth of 4½ fathoms (7^m8), is a detached shoal lying on a bank about 3 miles north-eastward of Capo Faro. It is frequented by fishermen.

Anchorage.—Anchorage can be obtained, by small vessels with local knowledge, off Pollara, with Punta del Perciato in line with the northern extreme of Scoglio Faraglione, in a depth of about 14 fathoms (25^m6), sand.

During southerly winds, small vessels with local knowledge could obtain temporary anchorage off Malfa.

Anchorage can be obtained, by vessels with local knowledge, in a depth of 16 fathoms (29^m3), opposite the southern church in Santa Marina Salina, about one cable offshore. The bottom is partly sand and partly rock, but the holding ground is good. Anchorage is prohibited off the southern end of the breakwater, on account of a submarine telegraph cable, see page 19, the position of which is indicated by a wavy line on the chart.

Temporary anchorage can be obtained in fine weather, by small vessels with local knowledge, about one cable offshore, abreast the church in Lingua, in a depth of 16 fathoms (29^m3); or south-westward of Punta Lingua, in depths of from 9 to 11 fathoms (16^m5 to 20^m1), about 2½ cables offshore.

Anchorage can be obtained, by small vessels with local knowledge,

Charts 1976, 165, 1800, 1440, 2158a and b.

Chart 172.

with the belfry in Rinella in line with that in Leni, in a depth of about 12 fathoms (21^m9), pebbles.

Isola Lipari.—**Caution.**—This island is the largest of the group, and lies south-eastward of Isola Salina, from which it is separated by a deep channel about 2 miles wide. In 1950, the population was about 9,500. Its eastern side is well cultivated and thickly populated, but its western side is cliffy, broken by ravines, and almost deserted. The three principal peaks in the island, from north to south, are Monte Chirica 1,975 feet (602^m2) high, Monte San Angelo, 1,946 feet (593^m1) high, and Monte Guardia, 1,211 feet (369^m1) high. See also views on chart 172 and page 452.

Western side.—**Dangers.**—Punta della Crapazza (*Lat.* 38° 26' N., *Long.* 14° 57' E.), the southern extremity of the island, appears from eastward or westward as a detached rock, and the coast on either side of it is high, steep and in places cliffy.

Punta del Perciato, which has a large hole through it, lies about half a mile north-westward of Punta del Crapazza.

Pietra Lunga, about 200 feet (61^m0) high, and Pietra Menalda, close south-westward of it, are both good marks, and lie about 2 cables southward of Punta del Perciato.

Le Formiche is a group of rocks lying on a detached shoal close north-westward of Punta del Perciato; one of them is high and a good mark, but the others are all very low or awash.

Punta di Iacopo lies about three-quarters of a mile north-north-westward of Punta del Perciato, and between them the coast is high and inaccessible. Northward of Punta di Iacopo is a cove, named Val di Muria, with a sandy beach, whence access can be obtained to the interior of the island.

Punta delle Grotticelle, which can be identified by several small caves at sea level, and by the red and yellow colour of its rocks, lies about one mile west-north-westward of Punta Iacobo.

Pietra del Bagno, high on its eastern and low at its western end, lies about 2½ cables offshore 1¼ miles north-westward of Punta delle Grotticelle. The channel between it and the island is foul.

Punta del Legno Nero lies about 3 miles north-north-eastward of Pietra del Bagno, and the coast between is barren, rocky and cultivated in a few places only. Close inshore about three-quarters of a mile south-westward of Punta del Legno Nero, stands Scoglio Immeruta, a hump-backed, above-water rock which is a good mark.

Quattropiani, at a short distance south-westward of Punta del Legno Nero, is a village, the cupola of the church and the tops of a few houses in which are visible from certain directions.

Off-lying shoal.—Banco del Bagno, with a depth of 7½ fathoms (13^m7), lies about 1½ miles westward of Punta delle Grotticelle; the rock is very small, and rises abruptly from considerable depths. Pietra Lunga in line with Punta della Crapazza, bearing about 098°, leads about one mile southward of the rock, and the summit of Isola Stromboli in line with the north-western extremity of Isola Lipari, bearing about 041°, leads about the same distance north-westward of it.

Anchorage.—Anchorage can be obtained, by small vessels with local knowledge, off Val di Muria, in depths of from 14 to 16 fathoms (25^m6 to 29^m3), sand, with La Formiche in line with Pietra Lunga.

Northern and eastern sides.—**Dangers.**—Acquacalda is a village,

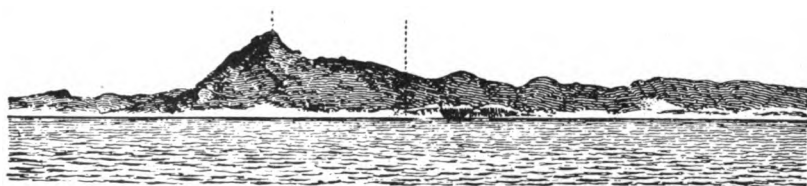
Charts 188, 1976, 165, 1800, 1440, 1258a and b.



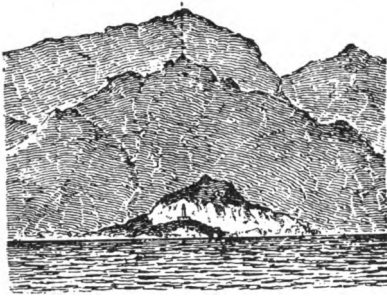
Capo Gallo lighthouse.
(Original dated 1942.)



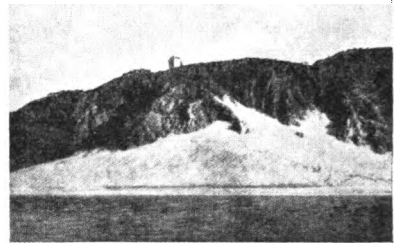
Capo Zaffarano lighthouse.
(Original dated 1942.)



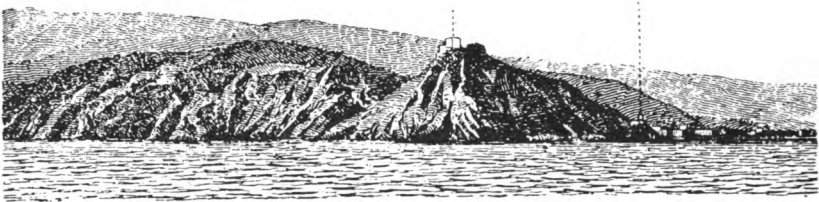
Summit, Termini
bearing 180°, 8 miles. Imeresi.
Monte Santo Calogero from northward.
(Original dated 1936.)



Capo Cefalù from
northward.



Capo Rasocolmo
from northward.



Church.

*Lighthouse,
bearing 195°.*

Capo d'Orlando from northward.



*Village,
bearing 180°, 8 miles.*

Pollina from northward.



*Isola
Vulcano.*

*Isola Lipari,
bearing 215°,
16 miles.*

*Scoglio
Immerota.*

*Santa Marina.
Isola Salina.*

Isola Salina from eastward.

(Originals dated 1936.)

Chart 172.

on the northern coast of the island, close eastward of Punta Legno Nero, from which pumice stone is exported. At the western end of the village is a sea-wall in the middle of which is a landing place. Farther eastward is part of a pier, the construction of which has been suspended. 5

Punta della Castagna, the north-eastern extremity of the island, is fringed with rocky shoals and rocks, awash, extending about half a cable offshore. The point is rocky, of a brownish-red colour, and south-westward of it rises Campo Bianco, a remarkable hill covered with white pumice stone. 10

From Punta della Castagna the coast trends about $1\frac{1}{2}$ miles southward to Canneto di Lipari, and is fringed by a bank, which, with depths of less than 5 fathoms (9^m1), sand and pumice stone, extends as much as $2\frac{1}{2}$ cables offshore in places.

Porticello (*Lat. $38^{\circ} 31' N.$, Long. $14^{\circ} 57' E.$*) is a village close southward of Punta della Castagna, and near it are some wooden chutes used in connection with the excavation of pumice stone. 15

Canneto di Lipari is a village where there are the ruins of a pier. Pilots, *see* page 20, can be obtained in the village.

Sciara di Monterosa, 784 feet (239^m0) high, and surmounted by a prominent iron cross, 50 feet in height, is the summit of a promontory close southward of Canneto di Lipari. 20

Anchorage.—Cautions.—Anchorage can be obtained, by vessels with local knowledge, off the centre of the village of Acquacalda, in a depth of 11 or 12 fathoms (20^m1 or 21^m9), sand. Care must be taken to avoid a submarine telegraph cable, *see* page 19, the route of which is indicated by a wavy line on the chart. 25

Anchorage can be obtained, by vessels with local knowledge, off Porticello.

Anchorage can be obtained, by small vessels with local knowledge, off Canneto di Lipari in depths of from 11 to 16 fathoms (20^m1 to 29^m3), sand and weed, about one cable offshore. Care must be taken to avoid a submarine telegraph cable, *see* page 19, the route of which is indicated by a wavy line on the chart. 30

Chart 172, plan of Lipari anchorage. 35

Rada di Lipari.—Lights.—Buoys.—This roadstead is situated on the southern side of the promontory of Sciara di Monterosa, and on its western shore is the town of Lipari, *see* view facing page 452, which, in 1950, had a population of about 7,000. In the middle of the front of the town, on a high, steep, volcanic projection, is the Castello, consisting of a partly ruined enclosure in which are several churches, a cathedral, and numerous houses, and northward of which is a remarkable building surmounting Punta Scaliddi. There is a hospital in the town. 40

Tunny nets, *see* page 27, are laid out annually in the vicinity of Punta Cappelluzza, the south-eastern extremity of the promontory of Sciara di Monterosa. 45

Moletto di Pignataro extends about three-quarters of a cable south-westward and west-south-westward from the northern shore, and affords shelter to small craft only. There is a white mooring buoy about three-quarters of a cable south-westward of its head. 50

A light is exhibited, at an elevation of 33 feet (10^m1), from a grey, iron column on a grey, iron hut, situated on the head of Moletto di Pignataro.

San Giacomo disused lighthouse consists of a turret surmounting

Charts 188, 1976, 165, 1800, 1440, 2158a and b.

Chart 172, plan of Lipari anchorage.

a red house, situated about $1\frac{1}{2}$ cables west-north-westward of the head of Moletto di Pignataro.

A light is exhibited, at an elevation of 46 feet (14^m0), from a square, 5 masonry hut, 16 feet (4^m9) in height, situated on Punta Scaliddi.

There is a landing place about one cable north-westward of Punta Scaliddi. About one cable north-eastward of the point lies a red mooring buoy, but, in 1945, this buoy was partly awash and could not be used. *See* view facing page 452.

10 A light (*Lat.* $38^\circ 28' N.$, *Long.* $14^\circ 57' E.$) is exhibited, at an elevation of 39 feet (11^m9), from an iron, framework structure, 34 feet (10^m4) in height, situated on the terrace of the post office, which stands on a small peninsula close southward of the Castello.

On the southern side of the above-mentioned peninsula is a wharf, 15 with depths of from 13 to 16 feet (4^m0 to 4^m9) alongside. On its northern side there is a small mole with depths of $6\frac{1}{2}$ feet (2^m0) at its head.

There are two quays on the northern side of the Castello, one of which has depths of from 2 to 23 feet (0^m6 to 7^m0) alongside; the 20 other is shallow.

Pilotage.—Pilots can be obtained at Canneto di Lipari. *See* pages 449 and 20.

Anchorages.—Ancoraggio del Pignataro di Fuori, over a sandy bottom, lies about one cable southward of a building on the shore 25 about $3\frac{1}{2}$ cables eastward of Moletto di Pignataro, in depths of from 16 to 22 fathoms (29^m3 to 40^m2).

Ancoraggio del Pignataro di Terra, the best with north-easterly winds, is off the head of the mole; but in winter heavy northerly squalls blow through the valley on the western side of Sciarra di 30 Monterosa.

Ancoraggio di Marina Lunga is northward of Punta Scaliddi; caution must be exercised for there is a deep hole between the point and the mooring buoy off it, and the sunken remains of a wharf lie about three-quarters of a cable off the beach. A vessel not in possession 35 of local knowledge should anchor off the church of Porto Salvo, situated about $3\frac{1}{2}$ cables north-north-westward of Punta Scaliddi, in depths of from 11 to 14 fathoms (20^m1 to 25^m6), from three-quarters of a cable to one cable offshore.

Anchorage can be obtained southward of Punta Scaliddi in depths of 40 from 14 to 19 fathoms (25^m6 to 34^m7); but anchorage is prohibited off the small cove on the northern side of the peninsula on which is the church of Anime del Purgatorio.

Chart 172.

Isola Vulcano.—Dangers.—Light.—This island, which, in 1950, 45 had a population of about 350, lies southward of Isola Lipari from which it is separated by Bocche di Vulcano, a deep channel about 4 cables wide that is free from dangers, with the exception of a 4-fathom (7^m3) patch about one cable from the northern coast of Isola Vulcano; *see* view on chart 172 and facing page 453. The island is fairly well 50 cultivated on its southern side, but the remainder is barren and rugged, especially on its western side. In the southern part of the island is an extinct volcano, the highest parts of which, namely, Monte Saraceno and Monte Aria, rise to elevations, respectively, of 1,578 and 1,637 feet (481^m0 and 499^m0).

Charts 188, 1976, 165, 1800, 1440, 2158a and b.

Chart 172.

Gran Cratere or Fossa di Vulcano (*Lat. 38° 24' N., Long. 14° 58' E.*), in the northern part of the island, is still active ; it is of characteristic shape and unusual colour, especially near its summit, which attains an elevation of 1,266 feet (385^m9). 5

Monte Vulcanello, 400 feet (121^m9) high and no longer active, forms the northern extremity of the island, and between it and Gran Cratere is a low sandy isthmus.

A light is exhibited, at an elevation of 148 feet (45^m1), from a white octagonal tower surmounting a white two-storied building, 135 feet (41^m1) in height, situated on Punta Praia dei Porci, the southern extremity of the island. *See* view facing page 453. 10

Punta Santa Rosario lies about 3½ cables westward of Punta Praia dei Porci, and Capo Secco and Testa Grossa lie, respectively, about 2 and 3 miles further north-westward ; all this coast is steep, rugged, barren, and fringed with rocks close inshore. 15

Punta del Monaco and Capo Grosso lie, respectively, about half a mile and one mile northward of Testa Grossa, and between them is Cala di Mastro Minico, near the middle of which is an above-water rock, named Mastro Minico. 20

Porto di Ponente, about half a mile north-eastward of Capo Grosso, is entered between Punta Cala Formaggio and the south-western side of Monte Vulcanello. Above-water rocks lie close off either side of the entrance, and the sandy isthmus southward of Monte Vulcanello lies at its head. 25

Porto di Levante, at the head of which are some houses, one of which is crenellated and has a red roof, is situated on the eastern side of the isthmus southward of Monte Vulcanello, and on the shore at its head are Faraglione della Fabbrica, two prominent, conical rocks, now joined together. 30

Cala Rossa, the shores of which are rocky and inaccessible, is entered between Punta Nere, the blackish southern entrance point of Porto di Levante, and Punta Luccia, about half a mile east-south-eastward.

Punta Molo di Femmina and Punta Bandiera lie, respectively, about 1½ and 2½ miles south-south-eastward of Punta Luccia and between them is a short beach of dark sand, but the remainder of the coast is steep, barren, and reddish in colour. 35

Punta Bandiera is the south-eastern extremity of the island, and on it is a small masonry shrine, on the slope above which is a prominent white cottage. 40

Insenatura di Cannitello is a small bay, on the south-western side of Punta Bandiera, at the head of which is a short stretch of dark sand, and the hillside above it is cultivated.

South-westward of Insenatura di Cannitello is another small bay in which are some rocks close inshore. 45

Anchorage.—Anchorage can be obtained, by small vessels with local knowledge, in Porto di Ponente.

Anchorage can be obtained in Porto di Levante, by small vessels with local knowledge, off Faraglione della Fabbrica, in a depth of about 16 fathoms (29^m3), sand, about half a cable from the shore. Vessels should not anchor off the southern shore of the bay for the bottom there is rocky. The sea water close to the shore in the southern part of the bay is very warm and sulphurous. 50

Charts 188, 1976, 165, 1800, 1440, 2158a and b.

Chart 172.

Small vessels, with local knowledge, can obtain anchorage in Insenatura di Cannitello.

Isola Panarea.—Light.—This island, *see* view facing page 452, lies about $7\frac{1}{2}$ miles north-eastward of Isola Lipari, and is mountainous. In 1950, the population was about 500. Its coasts are steep and rugged, especially on its western and northern sides, and it attains, at the summit of Pizzo del Corvo, on which is a small iron cross, an elevation of 1,381 feet (420^m9). It is well cultivated, especially in its eastern part, where the village of San Pietro, with a church, is situated close to Punta Peppemaria. On the northern side of this point is a pebbly beach from which projects a small masonry landing place. A local pilot, *see* page 20, can be obtained at San Pietro.

Scoglio La Nave, high and prominent, lies at a short distance from the north-western coast of the island; the other rocks fringing the island are all close inshore.

A light is exhibited, at an elevation of 56 feet (17^m1), from an iron framework pyramid, 30 feet (9^m1) in height, the lower part of which is enclosed and surrounded by a wall, situated on Punta Peppemaria.

Baia Milazzese, on the north-eastern side of the low Punta Milazzese, the southern extremity of the island, is divided into two coves, with stony beaches, by a small promontory which terminates in Punta Torrione.

Picco del Tribunale attains an elevation of 735 feet (224^m0), and is the higher and larger of two rocky masses on the slope of Pizzo del Corvo above Baia Milazzese (*Lat.* 38° 30' N., *Long.* 15° 04' E.).

Cala di Iunco is entered between Punta Milazzese and Capo Milazzese about one-quarter of a mile westward; it is encumbered with rocks.

Off-lying islets and shoals.—Isola Panarea lies on the western part of a bank with depths of less than 100 fathoms (182^m9), on the eastern part of which are several islets and shoals.

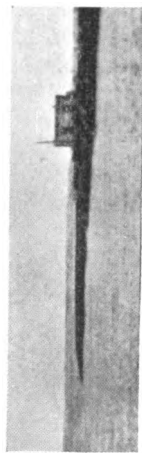
Secca dei Pesci, near the south-eastern extremity of the bank, has depths of from 17 to 30 fathoms (31^m1 to 54^m9).

Le Formiche is a steep-to group of rocks, just above water or awash, about half a mile south-south-eastward of Punta Peppemaria; these dangers are covered by the *red* sector of the light on Punta Peppemaria between the bearings 325° and 341°.

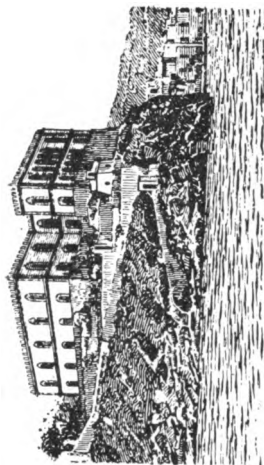
Lisca Nera, Bottaro, Lisca Bianca, Dattilo, and Panarelli are a group of islets within 2 miles eastward of Isola Panarea. A detached 6-foot (1^m8) patch lies about $1\frac{1}{2}$ cables east-south-eastward of Lisca Nera, the southernmost islet, which is low and black. Bottaro and Lisca Bianca, north-eastward of Lisca Nera, are joined by a shoal, and both are encrusted with sulphuretted aluminium; sulphuretted hydrogen is continually bubbling up between these islets. Dattilo, 338 feet (103^m0) high, the westernmost of the group, is also of volcanic formation, but owing to the iron in the composition of its lava, it is mostly of a reddish colour. The very low rocks forming Panarelli, the northernmost of the group, though quite close to Dattilo, differ considerably from it, being formed of a very hard, pungent, vitreous lava. A rock, with a depth of $2\frac{3}{4}$ fathoms (5^m0), lies about 2 cables north-eastward; and a $4\frac{1}{4}$ -fathom (7^m8) shoal lies about 2 cables eastward of Panarelli.

Basiluzzo (*Lat.* 38° 40' N., *Long.* 15° 07' E.), the largest and northernmost of the islets on the bank, is 541 feet (164^m9) high and lies about 2 miles north-eastward of Isola Panarea. Its coasts are high, cliffy

Charts 188, 1976, 165, 1800, 1440, 2158a and b.



*Lighthouse, bearing
about 225°.*
Punta Lingua from north-eastward.
(Original dated 1938.)

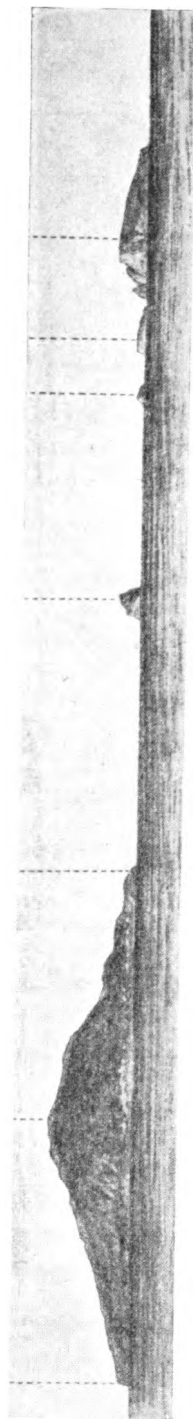


Punta Scaliddi lighthouse.
(Original dated 1942.)



**Castello
di Lipari.** **S. Giacomo
old lighthouse,
bearing 349°.** **Monterosa.** **Isola
Panarea.**

Rada di Lipari from south-eastward.
(Original dated 1877.)



**Capo
Milazzese.** **Pizzo del Corvo,
bearing 330°, 8 miles.** **Punta
Briglia.** **Dattilo.** **Basiluzzo.**
Isola Panarea and off-lying islets from south-eastward.
(Original dated 1936.) **Lisca Bianca.** **Boltaro.**



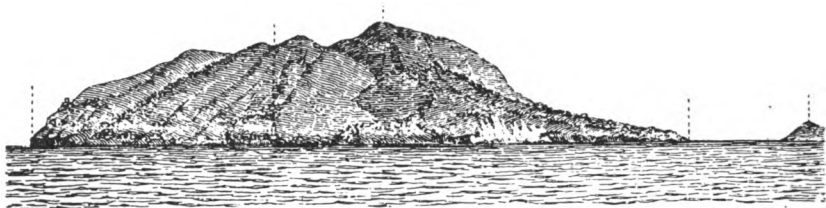
Punta Praia dei
Porci lighthouse.
(Original dated 1942.)



Punta Pezzo
lighthouse.
(Original dated 1933.)



Capo dell' Armi
lighthouse.
(Original dated 1933.)



Punta
Praia dei Porci
lighthouse, bearing
323°, one mile.

Monte Aria.

Punta
Bandiera.

Isola
Panarea.

Isola Vulcano from south-eastward.
(Original dated 1936.)



Capo Peloro lighthouse, bearing 200°.
(Original dated 1947.)

Chart 172.

and much indented, and its summit, which is partially cultivated, is flat and slopes gradually from north to south. The islet is only inhabited during the season of cultivation; access to the summit is obtained from its south-eastern extremity.

Scoglio Spinazzolo is a high, steep-sided rock close off the western extremity of Basiluzzo.

Anchorage.—Cautions.—The depths off the eastern and south-eastern coasts of Isola Panarea are moderate, and anchorage can be obtained; a good berth for a large vessel is north-eastward of Punta Peppemaria, with the summit of Scoglio Spinazzolo in line with the south-eastern extremity of Isola Stromboli, and the northern extremity of Lisca Bianca in line with that of Dattilo; this anchorage is about $2\frac{1}{2}$ cables offshore in a depth of 12 or 13 fathoms (21^m9 or 23^m8).

Anchorage can be obtained, by small vessels with local knowledge, northward of Punta Peppemaria and about three-quarters of a cable offshore, in depths of from $4\frac{1}{2}$ to 5 fathoms (7^m8 to 9^m1); but care must be taken to avoid a submarine telegraph cable, *see* page 19, the route of which is indicated by a wavy line on the chart. Anchorage can also be obtained about $2\frac{1}{2}$ cables south-eastward of the point, in depths of from 8 to 14 fathoms (14^m6 to 25^m6), good holding ground of sand and weed.

Anchorage can be obtained, by vessels with local knowledge, off Baia Milazzese, with the summit of Dattilo bearing 055° , and Picco del Tribunale bearing 355° ; but care must be taken to avoid a submarine telegraph cable, *see* page 19, the route of which is indicated by a wavy line on the chart.

Isola Stromboli.—This island, which, in 1950, had a population of about 1,800, is situated with Punta del Monaco, its southern extremity, about 8 miles north-eastward of Basiluzzo; it is 3,136 feet (995^m8) high, and is wholly formed of a conical volcano, *see* view facing page 461. The volcano is in almost continuous activity and the stream of lava, stones, and cinders, which descends steeply to the sea on its north-western side, is in marked contrast to the verdant slopes on the north-eastern side of the island. The coasts of the island are generally rocky, rugged, and cliffy. Wine, currants, and capers are exported.

Ginostra is a small village, the white houses and the church of which are situated in a fertile zone on the south-western side of the island, about $1\frac{1}{2}$ miles north-westward of Punta del Monaco. There is a masonry landing place surrounded by rocks at the foot of a remarkable zig-zag stairway leading to the village. Anchorage cannot be obtained off the landing place.

Punta delle Chiappe, the western extremity of the island, is rugged, rocky, and fringed with rocks close inshore; it rises to a rounded hill.

Punta Labronzo, the northern extremity of the island, is fringed with rocks, some of which are above water, and it should not be approached within 2 cables; on it is a solitary white square cottage. Southward of Punta Labronzo is Sciarra del Fuoco, a depression usually filled with white vapour.

Punta della Lena (*Lat. $38^\circ 48' N.$, Long. $15^\circ 15' E.$*) is the north-eastern extremity of the island. A sandy bank, with depths of less than 5 fathoms (9^m1), extends about one-quarter of a mile north-eastward of this point, and on it lie two rocks, with depths of $2\frac{1}{2}$ and 4 fathoms (5^m0 and 7^m3), respectively. Close to Punta della Lena is

Charts 1976, 165, 1800, 1440, 2158a and b.

Chart 172.

a building with a tall red chimney, and north-westward of the point there is a sandy beach.

Scari, San Vincenzo, Piscità, and San Bartolo are villages extending almost without interruption along the north-eastern coast of the island from a position close southward of Punta della Lena.

Caution.—For caution with reference to fishing nets north-eastward of Isola Stromboli, *see* page 445.

Storm signals.—Storm signals are shown from the signal station on Isola Stromboli; *see* page 12.

Anchorage.—Anchorage can be obtained, by small vessels with local knowledge, in a cove with a sandy beach, named Insenatura di Ficogrande, at a short distance eastward of Punta Labronzo.

Temporary anchorage can be obtained by vessels with local knowledge, with the church in San Vincenzo bearing 262° , in a depth of 11 fathoms (20^m), sand, about $2\frac{1}{2}$ cables offshore.

Anchorage is only possible in good weather; at the first indications of strong winds it is prudent to put to sea.

Off-lying islet.—**Light.**—Strombolicchio, about 9 cables north-north-eastward of Punta della Lena, is a steep-to, steep-sided rock, about 164 feet (50^m) high, on the summit of which are some rocky protuberances. Its eastern side is light in colour and has reddish fissures. On its north-western side is a flight of steps cut in the rock (*Lat.* $38^\circ 49' N.$, *Long.* $15^\circ 15' E.$).

A light is exhibited, at an elevation of 174 feet (53^m), from an iron framework structure surmounting a hut, 20 feet (6^m) in height, situated on the summit of Strombolicchio. *See* view facing page 461.

Charts 177 and 3935.

STRETTO DI MESSINA.—**General remarks.**—This strait, which is very deep and free from off-lying dangers, separates the island of Sicily from the coast of Calabria, Italy, *see* view on chart 188, and is narrowest at its northern end, between Capo Peloro and Torre Cavallo, where it is not less than $1\frac{1}{2}$ miles wide. At its southern end, between Capo Scaletta and Punta Pellaro, *see* page 458, it is about $7\frac{1}{2}$ miles wide.

The currents and whirlpools, famous from antiquity, *see* page 460, are such as to necessitate some caution in the navigation of the strait; moreover, in the vicinity of the high land, on either side, vessels are exposed to violent squalls which descend through the valleys with such strength as, at times, to inconvenience even steamers.

Pilotage is compulsory at all the principal Italian ports. Pilots are available at Messina for Stretto di Messina, on application to the Captain of the Port; local pilots can be obtained at Torre Faro. The pilot boats from Messina have the letter P in white on a black background painted on the bows; by day, they display the pilot flag, and, at night, they exhibit the regulation lights.

Fishing is practised to a considerable extent, all the year round, along the shores on either side of Stretto di Messina, both by day and at night, but the nets do not interfere with navigation.

The coast of Calabria, forming the eastern shore of Stretto di Messina, is fully described in *Mediterranean Pilot*, Vol. II., but for the convenience of mariners the most important features are also described in this volume.

Charts 1976, 198, 165, 1800, 1440, 2158a and b.

Chart 177.

Capo Peloro. — Dangers. — Lights. — Signal station. — This low, sandy cape, *see* view facing page 453, is the north-eastern extremity of Sicily, and on its southern side stands the village of Torre Faro; in this village there is a prominent white church with a red roof and a low belfry. The hills which back the eastern end of the northern coast of Sicily, *see* page 444, extend westward from a position about one mile westward of Capo Peloro. On them about $1\frac{1}{2}$ miles westward of the cape, at an elevation of 322 feet (98^m1), stands Forte Spuria, and about $1\frac{1}{4}$ miles further westward, at an elevation of 581 feet (177^m1), stands the village of Faro Superiore. 5 10

Capo Peloro is subject to erosion, and is fringed by a bank, which, with depths of less than 3 fathoms (5^m5), extends 2 cables north-eastward and $1\frac{1}{2}$ cables eastward. This cape should not be approached within half a mile, except by vessels seeking anchorage. An obstruction on which a vessel struck was reported, in 1943, to lie about 4 cables northward off Capo Peloro lighthouse. 15

A light is exhibited, at an elevation of 121 feet (36^m9), from an octagonal tower, 128 feet (39^m0) in height, painted black and white in horizontal bands and surmounting a white building, situated on Capo Peloro (*Lat.* 38° 16' N., *Long.* 15° 39' E.). An auxiliary light is exhibited, at an elevation of 74 feet (22^m6), from the same tower.

A disused lighthouse consisting of a white circular tower, 30 feet (9^m1) in height, with the legend "Divietu d'Ancoraggio e di Pesca," stands on Punta Mazzone, about half a mile north-westward of Capo Peloro lighthouse. 25

A light is exhibited, at an elevation of 30 feet (9^m1), from a grey iron structure on a grey circular iron hut, 25 feet (7^m6) in height, situated on Punta Sottile, about $1\frac{1}{4}$ cables south-south-westward of Capo Peloro lighthouse. 30

A signal station is maintained in Forte Spuria. It consists of a circular turret, situated on a thickly wooded hill, and is not visible from eastward. Storm signals, *see* page 12, are shown.

Northern part of Stretto di Messina. — Lights. — Signal station. — The small town of Scilla is situated on the eastern side of the northern end of the strait about 3 miles east-south-eastward of Capo Peloro. 35

A light is exhibited, at an elevation of 236 feet (71^m9), from a grey circular concrete tower, 18 feet (5^m5) in height, situated in the castle at Scilla.

A light is exhibited, at an elevation of 33 feet (10^m1), from a square concrete hut situated on the head of the mole at Scilla. 40

Torre Cavallo, a tall, circular, partly ruined tower with a wall on its south-western side and having a road supported on arches and embankments at its foot, is situated on the coast about $1\frac{1}{4}$ miles west-south-westward of Scilla. 45

Punta Pezzo lies about $1\frac{1}{4}$ miles west-south-westward of Torre Cavallo, and on the coast between them is the village of Cannitello.

A light is exhibited, at an elevation of 46 feet (14^m0), from a white, iron framework structure on a white, circular turret, 46 feet (14^m0) in height, situated on Punta Pezzo. *See* view facing page 453. 50

From the village of Torre Faro, the western shore of the strait consists of a steep-to sandy beach which trends about 6 miles south-westward to the entrance of Porto di Messina, *see* page 461.

Ganzirri, Santa Agata, Grotta, Pace and Paradiso are villages

Charts 3935, 188, 1976, 198, 165, 1800, 1440, 2158a and b.

R

Chart 177.

situated, respectively, about $1\frac{1}{2}$, 2, 3, $3\frac{1}{2}$ and 4 miles south-westward of Torre Faro. A beacon stands on the coast east-south-eastward of Santa Agata; a white church, with a red roof and belfry, stands in 5 Ganzirri; and in Pace there is a grey, hemispherical cupola.

Fiumara dell'Annunziata, Fiumara di San Licandro and Fiumara di San Francesco di Paolo flow into the strait about $1\frac{1}{2}$, 2 and $2\frac{1}{4}$ miles, respectively, south-south-westward of Pace. The convent of San Salvatore dei Greci stands on the shore on the southern side of the 10 mouth of Fiumara dell'Annunziata.

From Punta Pezzo the eastern shore of the strait trends about three-quarters of a mile southward to the small harbour at Villa San Giovanni, close southward of which is a village named Acciarello.

A light is exhibited, at an elevation of 38 feet (11^m6), from a small 15 stone tower, situated on the head of the mole at Villa San Giovanni.

Punta San Raineri, on the western side of the strait, is the eastern extremity of Braccio di San Raineri, *see* page 461.

A light is exhibited, at an elevation of 43 feet (13^m1), from a small, iron, framework structure on a square tower, painted red and white in 20 horizontal bands and 39 feet (11^m9) in height, situated on Punta Secca, the north-eastern extremity of Braccio di San Raineri. *See* view facing page 460.

A light is exhibited, at an elevation of 136 feet (41^m4), from an octagonal turret, painted black and white in horizontal bands, sur- 25 mounting a grey, square tower, 140 feet (42^m6) in height, situated on Punta San Raineri. Close to the lighthouse stands a signal station, and southward of it there are several oil tanks. *See* view facing page 460.

Storm signals.—Storm signals, *see* page 12, are shown from the 30 signal station on Punta San Raineri.

Anchoragees.—**Caution.**—Anchorage is prohibited off the coast between the mouth of Fiumara dell'Annunziata and a position about one cable southward of the mouth of Fiumara di San Licandro. Three pillar buoys are moored off the coast in this vicinity. Anchorage is 35 also prohibited off the coast between the western extremity of Forte San Salvatore (page 461) and the old citadel, about $4\frac{1}{2}$ cables south-westward of Punta San Raineri (*Lat.* $38^\circ 12' N.$, *Long.* $15^\circ 35' E.$).

Anchorage is prohibited off the coast between a position about $1\frac{1}{2}$ cables southward of the root of the mole at Villa San Giovanni and 40 the mouths of Fiumara di Catona, near the village of Catona, about $1\frac{1}{2}$ miles further southward.

Temporary anchorage can be obtained by small vessels, with local knowledge, on the coastal bank fringing Capo Peloro. There are depths of from 9 to 11 fathoms (16^m5 to 20^m1) about $2\frac{1}{4}$ cables north- 45 eastward of the lighthouse, beyond which the depths increase suddenly. This anchorage is known as Ancoraggio della Piana.

Temporary anchorage can be obtained by small vessels, with local knowledge, in a depth of 16 fathoms (29^m3), about three-quarters of a cable offshore, abreast the church in Torre Faro.

50 Anchorage can be obtained off Marina Grande di Scilla, south-westward of the castle, in depths of 5 fathoms (9^m1), sand, about $1\frac{1}{2}$ cables offshore. The anchorage is exposed to the strong currents of Stretto di Messina, and is dangerous during gales.

Temporary anchorage can be obtained off the mouth of Fiumara di

Charts 3935, 188, 1976, 198, 165, 1800, 1440, 2158a and b.

Chart 177.

Santa Trara (Alta Fiumara) about half a mile west-south-westward of Torre Cavallo, in depths of 16 fathoms (29^m3), 1½ cables offshore. Small vessels can anchor closer inshore in a depth of 11 fathoms (20^m1).

Temporary anchorage can be obtained by small vessels off Ganzirri, 5 in a depth of 6 fathoms (11^m0), sand and good holding ground; but it is exposed to strong south-easterly and south-south-easterly winds, which raise a heavy sea.

Temporary anchorage can be obtained by small vessels north-eastward of the cupola in Pace, about 1½ cables offshore, in depths of 10 from 11 to 16 fathoms (20^m1 to 29^m3), sand. Caution must be exercised for there are two groups of rocks, close inshore, with depths of 13 feet (4^m0).

Ancoraggio di Paradiso lies about half a mile southward of the village of Paradiso (*Lat.* 38° 14' N., *Long.* 15° 34' E.). The holding 15 ground is good, but the outer part of the anchorage is exposed to the full force of the tidal streams. Vessels anchor about 2½ cables offshore, in depths of from 16 to 22 fathoms (29^m3 to 40^m2); small vessels can anchor in 3½ fathoms (5^m9), about 75 yards (68^m6) offshore. There is a mooring buoy in the anchorage. 20

Ancoraggio di della Fiera Campionaria, northward of the entrance to Porto di Messina, affords good holding ground of fine gravel or sand, the depths being less than 27 fathoms (49^m4) within 1½ cables of the shore. This anchorage is said to be the best on this side of the strait, but in winter it is exposed to strong northerly gusts and pre- 25 cautions must be taken to avoid dragging into deep water southward of it.

*Chart 3935.***Southern part of Stretto di Messina.—Lights.—Signal station.**

—From Punta San Raineri, the shore on the western side of the strait 30 trends south-south-westward, and is steep-to, sandy, and nearly straight; it is backed by a range of mountains which gradually withdraws inland and increases in elevation until, about 30 miles south-westward of Capo Peloro, it joins another range trending westward. The lower slopes of the mountains are fertile and well watered, though 35 many of the streams are dry in summer; the coast is skirted by a railway, and along it, and on the slopes of the mountains, are numerous small villages and detached buildings.

Monte Antennamare, about 5½ miles west-south-westward of Punta San Raineri, is 3,687 feet (1,123^m8) high, and prominent. It has a flat 40 summit, but from certain directions it appears conical.

Gazzi is a town which, in 1950, had a population of about 21,000, situated on the shore about 2 miles southward of Punta San Raineri. Fiumara di Gazzi flows into the sea close southward of the town.

Fiumara San Filippo, with a wide whitish bed, flows into the sea 45 about one mile south-westward of Fiumara di Gazzi. A church, with a white belfry like an obelisk, stands on the south-western side of its mouth.

The village of Mili Marina is situated close northward of the mouth of Fiumara Mili about 5 miles south-westward of Punta San Raineri. 50 Monte Gallo, which has a flattish summit, rises to an elevation of 1,106 feet (337^m1), about 8 cables north-westward of Mili Marina.

Galati Marina is a village situated about one mile southward of Mili Marina. It can be identified by a whitish church with a red roof.

Charts 188, 1976, 198, 165, 1800, 1440, 2158a and b.

Chart 3935.

and a low square belfry. About half a mile southward of Galati Marina, the mouth of Fiumara di San Stefano is spanned by an iron bridge of three spans. About $1\frac{1}{2}$ miles southward of the mouth of this
 5 river stands Scuola di Agricoltura, a large and prominent building, standing on a hillock.

San Paolo is a village with a white church standing on the southern side of the mouth of Fiumara di Briga, about half a mile southward of Scuola di Agricoltura; on the hill above it stands a building with
 10 two turrets (*Lat.* $38^{\circ} 04' N.$, *Long.* $15^{\circ} 29' E.$).

The convent of San Placido is a building situated on a hill, about half a mile southward of San Paolo; being the same colour as the land behind it, it does not show up well.

There is a mooring buoy in Rada di Pentimele, on the eastern side of
 15 the strait, about 5 miles southward of Villa San Giovanni and half a mile northward of the entrance to Porto di Reggio.

Chart 188, plan of Porto di Reggio.

Porto di Reggio is a small harbour on the eastern side of the strait, about $5\frac{1}{2}$ miles southward of Villa San Giovanni, and about midway
 20 between is the mouth of Fiumara di Gallico. In 1946, there were depths of 30 feet (9^m1) in the entrance and eastern part of the harbour, and of from 23 to 26 feet alongside the eastern side of the mole. Vessels should not attempt to enter without local knowledge.

A light is exhibited, at an elevation of 44 feet (13^m4), from a black,
 25 wooden structure on a black, wooden hut, 33 feet (10^m1) in height, situated on the head of the mole on the western side of the entrance to Porto di Reggio. In 1951, this mole was being extended.

A light is exhibited, at an elevation of 26 feet (7^m9), from a red, iron, framework structure on a red, iron hut, 23 feet (7^m0) in height,
 30 situated on the head of the eastern mole at the entrance to Porto di Reggio.

Chart 3935.

Punta Calamizzi lies about $1\frac{1}{2}$ miles south-south-westward of Porto di Reggio, and close off it are some sunken rocks. Fiumara di Sant'-
 35 Agata flows into the sea about $1\frac{1}{2}$ miles southward of Punta Calamizzi.

Punta Pellaro is a somewhat salient, sandy point, situated about $4\frac{1}{2}$ miles southward of Punta Calamizzi; from it a shoal bank extends a short distance offshore.

A light is exhibited, at an elevation of 313 feet (95^m4), from a small,
 40 white, octagonal tower surmounting a white two-storied dwelling, 39 feet (11^m9) in height; situated on Capo dell'Armi, about $4\frac{1}{2}$ miles south-south-eastward of Punta Pellaro. See view facing page 453.

A signal station, consisting of a hut attached to a low building, painted black and white in chequers and resembling a tower, is situ-
 45 ated, at an elevation of 415 feet (126^m5), about Capo dell'Armi light-house. In 1950, this station was closed.

Capo Scaletta, on the western side of the strait, about one mile southward of San Paolo, is dominated, on its south-western side, by Scaletta Superiore, in which town is a large square tower and above
 50 which is a remarkable rocky pinnacle; higher still, there is a small conical peak. Scaletta Zanclea comprises six villages close to one another on the southern side of Capo Scaletta.

Monte Scuderi rises to an elevation of 4,111 feet ($1,253^m0$) about $3\frac{1}{2}$ miles west-north-westward of Capo Scaletta. From northward or

Charts 1976, 198, 165, 1800, 1440, 2158a and b.

Chart 3935.

southward, its summit appears rounded, but from eastward it is in the form of a trapezium (*Lat.* 38° 04' N., *Long.* 15° 24' E.).

Prohibited anchorage.—Anchorage is prohibited off Gazzi.

Anchorage.—Temporary anchorage can be obtained, by vessels 5 with local knowledge, off the village of San Paolo.

Vessels with local knowledge can obtain anchorage in Rada di Pentimele, *see* page 458, in depths of 27 fathoms (49^m4), good holding ground, about 2 cables offshore; or in depths of 25 fathoms (45^m7), about 3 cables 242° from a factory chimney. 10

Anchorage can be obtained in depths of from 14 to 16 fathoms (25^m6 to 29^m3), in a small bight, known as Giunchi or Monsolini, close southward of Porto di Reggio and about half a cable offshore, or abreast the masonry pier at the town of Reggio. In both places shelter is afforded from north-easterly winds, but in neither is the anchorage tenable with strong winds from other directions, and in the latter the depths increase suddenly. 15

Charts 177, 3935.

Tidal streams.—Stretto di Messina connects the Tyrrhenian sea northward with the Ionian sea southward. In both these seas the 20 tides are of the same type, viz. predominantly semi-diurnal with two high waters and two low waters each lunar day. Off Capo Peloro, at the northern entrance to the strait, the tide behaves like that of the Tyrrhenian sea; from Punta Pezzo southwards it behaves like that of the Ionian sea. Though these two tides are of the same type, 25 the times at which the high and low waters occur differ at the strait by about six hours; hence when it is high water at Capo Peloro it is low water at Villa San Giovanni, only three miles further southward, and vice versa. Hence twice each lunar day the water level has a maximum slope northward through the strait, and twice each lunar 30 day a slope southward. Though the difference of level is small, amounting to less than a foot at springs, it is concentrated into such a short distance that streams with a rate of 4 knots at springs are generated by it. These streams run with their greatest force where the strait is narrowest and shallowest, viz. between Punta Pezzo and 35 Ganzirri, and their strength diminishes rapidly northward and southward of this line as the strait deepens rapidly.

The waters of the Ionian sea southward are appreciably colder and more salt than those of the Tyrrhenian sea northward. The difference in density of the waters at the two ends of the strait sets up 40 currents which flow southward through the strait on the surface and northward below about 15 fathoms. The normal rate of the surface south-going current is about 0.2 knot, although with some strong winds its rate may rise to as much as one knot. This steady south-going current has usually little effect on the tidal streams at springs 45 but causes the north-going stream to begin later and to finish earlier at neaps; at springs the north-going and south-going streams run for 6½ hours each with a maximum rate of 4½ knots; at neaps the north-going stream runs for only about 5½ hours and the south-going stream for 7 hours with a maximum rate of 2½ knots. A strong northerly 50 wind can reduce the duration of the north-going stream to 3 hours, and increase that of the south-going stream to 9½ hours.

Under ordinary conditions at springs, the north-going stream in mid-channel between Punta Pezzo and Ganzirri begins at about 1 h.

Charts 188, 1976, 198, 165, 1800, 1440, 2158a and b.

Charts 177, 3935.

45 m. before high water at Gibraltar. Southward of this line the north-going stream begins later; off Pace it begins about 0 h. 15 m. before high water at Gibraltar, and its strength is only half those given
 5 above. Northward of the line, the north-going stream begins earlier; between Capo Peloro and Torre Cavallo about 2 h. 15 m. before high water at Gibraltar, and north-westward of Scilla about 2 h. 45 m. before high water at Gibraltar. The strength off Scilla is only about a third of that off Punta Pezzo. The north-going stream sets along the
 10 axis of the strait throughout.

The south-going stream begins at about 4 h. 30 m. after high water at Gibraltar off Punta Pezzo under ordinary conditions at springs. As previously mentioned, the time of beginning is earlier at neaps or when the steady current through the strait is stronger than usual.
 15 It begins earlier northward of Punta Pezzo and later southward by about the same amount as the north-going stream; the reductions in rate are also similar. It deviates somewhat from the axis of the strait; first it sets towards Torre Cavallo, thence past Punta Pezzo and across towards the Sicilian shore in the direction of Pace. It then sets down
 20 the Sicilian shore as far as Punta Secca (across the entrance to Porto di Messina) and thence crosses to the Calabrian shore and past Reggio, at the same time becoming wider and considerably weaker.

The north-going and south-going streams are known locally as the "Montante" and the "Scandente," respectively.

25 At each turn of the tide, there occurs a brief stand followed by one or more "Tagli" or bores (similar in many respects to those set up in certain rivers) as the contrary stream establishes itself. These are caused by the particular shape of the bottom of the strait (in particular the submarine ridge from Punta Pezzo to Ganzirri) and by the difference
 30 in density between the two streams of water. The first "Taglio" consists of a band of waves, with their crests lying across the strait and of no great height, which moves northward or southward between Capo Peloro and a position just southward of Messina. After it has passed, the north- (or south-) going stream becomes established. The
 35 second "Taglio," which is marked by higher waves—up to 4 feet (1^m2) in height off Punta Pezzo—and by many eddies and small whirlpools, passes up to an hour after the first; as it passes the stream increases in strength to a rate not much short of its maximum. If the wind is blowing against the advancing "Taglio" the short high seas formed
 40 may become dangerous for small craft.

Near the shores of the strait the streams may give rise to eddies with counter-currents close inshore, especially off or in the lee of projecting headlands. These eddies are locally termed "Bastardi" or "Refoli"; they extend half a mile or less offshore and begin from one
 45 to 2 hours after the turn of the stream. The most marked of these eddies are:—

On the North-going stream (Montante).

- (a) West-south-westward of Capo Peloro off Torre Faro.
- (b) From the entrance to Porto di Messina northwards to San
 50 Francesco di Paola.
- (c) North-eastward of Punta Pezzo between Conitello and Torre Cavallo (*Lat. 38° 15' N., Long. 15° 41' E.*).

On the South-going stream (Scandente).

- (a) From the old fort at San Salvatore clockwise round Messina

Charts 188, 1976, 198, 165, 1800, 1440, 2158a and b.

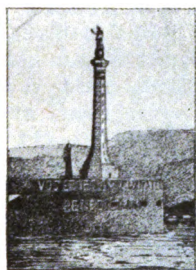


┐ Punta San
Raineri lighthouse.

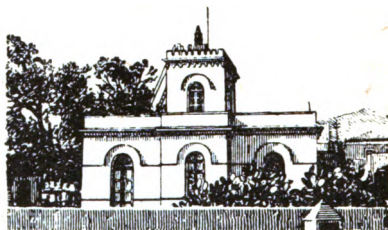
Punta Secca
lighthouse, bearing
170°.

Punta Secca and Punta S. Raineri lighthouses
from northward.

(Original dated 1942.)



Forte S. Salvatore.
(Original dated 1935.)



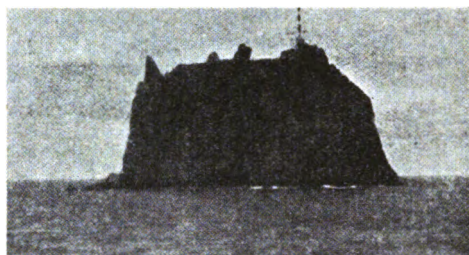
Riposto lighthouse.
(Original dated 1942.)



*Punta
delle
Chiappe.*

*Summit,
bearing 040°, 3 miles.*

Isola Stromboli from south-westward.



*Lighthouse, bearing
260°, 2½ miles.*

Strombolicchio from eastward.



*Montagnola,
bearing about 270°, 2 miles.*

Isola Alicudi from eastward.

(Originals dated 1936.)

Charts 177, 3935.

Harbour and thence up the coast past San Francesco di Paola to Pace and Santa Agata.

(b) Southward of Capo Peloro.

(c) Off Aciarello. 5

(d) Between Catona and Punta Calamizzi.

Small whirlpools ("Garofali" or "Vortici") are seen in most parts of the strait especially soon after one or other of the "Tagli" has passed. They mark areas where the denser water is sinking. They are commonly accompanied by smooth oily patches ("Sorgimenti" or "Macchis d'Olio") where water is welling up from below. The only whirlpools which present any danger even to small craft are those which form always near the same places owing to peculiarities in the bottom. These are:—

(a) Off the beach southward of Punta San Raineri. 15

(b) From 200 to 300 yards (182^m9 to 274^m3) offshore abreast Torre Faro.

(c) A few hundred yards westward of Punta Pezzo.

They are stronger and larger at springs; any one of them does not exist continuously but lasts up to about half an hour when it dies away and a new one starts up nearby; (b) is the Charybdis of the ancients; its opposite number Scilla is now very feeble due to changes in the local topography caused by an earthquake in February 1783. There is, however, every reason to suppose that a whirl did exist off the town of Scilla and that both it and Charybdis were rather more impressive than the latter is to-day. 20

Chart 177, plan of Messina harbour.

Porto di Messina.—Lights.—This harbour, on the western side of which lies the town of Messina, is situated between the coast and a tongue of land, named Braccio di San Rainer, which, curving north-eastward, northward and finally westward, forms an almost circular basin, and terminates in Forte San Salvatore (*Lat.* 38° 12' N., *Long.* 15° 34' E.). The harbour can accommodate vessels up to 656 feet (199^m9) in length, drawing up to 29½ feet (9^m0). 30

A statue situated close westward of Forte San Salvatore is conspicuous. Other prominent objects are:—The observatory tower about 5 cables west-north-westward; the square tower and spire of the cathedral about 4½ cables south-westward; the dome of Santa Caterina church about 6 cables south-south-westward; and a chimney about 6 cables southward of the conspicuous statue. 40

Forte Castellaccio, about half a mile westward of the town, see chart 177, stands at an elevation of 460 feet (139^m8), and is a good mark, as are Forte Gonzaga, at a slightly greater elevation about half a mile southward of it, and a large cemetery on a gentle slope surmounted by a church about 1½ miles southward of it. 45

Two lights, disposed vertically, are exhibited, at elevations of 64 and 77 feet (19^m5 and 23^m5), respectively, from a red, iron, framework structure, 39 feet (11^m9) in height, situated in Forte San Salvatore. See view facing page 460.

Two lights, disposed vertically, are exhibited, at elevations of 41 and 54 feet (12^m5 and 16^m5), respectively, from a black, iron, framework structure, with white horizontal bands, 41 feet (12^m5) in height, situated on the western side of the entrance on the north-eastern corner of the wharf at the post office.

Charts 188, 1976, 198, 165, 1800, 1440, 2158a and b.

Chart 177, plan of Messina harbour.

A light is exhibited from the head of each of the five train ferry jetties at the head of the harbour.

There are wharves all along the western and southern sides of the 5 harbour, and in its southern side are the piers used by the ferry steamers; near these piers are the ruins of the citadel, on the north-western and northern sides of which, respectively, are Pontile Norimberga and Banchina Egeo (Elevatore).

North-eastward of Banchina Egeo lies Darsena de Levante, a 10 shallow basin bounded northward by Pontile Libia. Darsena de Levante is quayed on its northern and western sides, and from its northern side a pier extends about half a cable southward. In 1947, the part of the basin westward of the pier had been dredged to depths of from 9 to 11 feet (2^m7 to 3^m4).

15 The area north-eastward of an imaginary line joining the north-western corner of Pontile Libia (*Lat.* 38° 12' N., *Long.* 15° 34' E.) and the western extremity of Forte San Salvatore is reserved for the use of Naval vessels, and no others are allowed to enter it without permission. In the south-eastern corner of this area there is a dry 20 dock, and on the northern side of Pontile Libia there is a floating dock; see page 487.

There are several mooring buoys in the north-eastern part of the harbour, and about 1½ cables south-eastward of Forte San Salvatore is a buoy used for swinging for the adjustment of compasses. All the 25 wharves are provided with mooring bollards, and those in the south-eastern part of the harbour are connected with the railway.

Pilotage.—Pilotage is compulsory for all merchant vessels exceeding 200 tons, and for naval vessels exceeding 3,000 tons displacement. Vessels arriving should await the pilot about one mile north-eastward 30 of the harbour entrance. See page 20.

Anchorage.—Regulations.—No vessel is allowed to swing at her anchors within the harbour; all must be secured head and stern.

The speed of vessels entering or leaving the harbour must not exceed 5 knots.

35 Vessels entering or leaving the harbour should not approach within 80 yards (73^m1) of the Port office nor within 45 yards (41^m1) of Forte San Salvatore.

Vessels are prohibited from passing one another in the entrance of the harbour. Men of war have precedence over all merchant vessels, 40 whether entering or leaving. Merchant vessels leaving have precedence over those entering.

At spring tides, with a strong northerly wind, the north-going tidal stream raises such a heavy sea off Punta San Raineri that a vessel bound for the harbour from southward should give that point a very 45 wide berth, and should approach the entrance from east-north-eastward.

About two hours after the "Scendente" is established in the strait, a tidal stream enters the harbour and setting towards the piers used by the ferry-boats divides, one part flowing northward along either side of 50 the harbour; in the entrance of the harbour, the eastern of these two north-going branches is the wider. A similar stream is established during the "Montante" but it is of considerably less strength. In the vicinity of the swinging buoy, the direction of the stream is very variable.

Charts 3935, 188, 1976, 198, 165, 1800, 1440, 2158a and b.

Chart 177, plan of Messina harbour.

The arrival and departure of aircraft, *see* page 23, is notified by the displaying of a red ball at the Port office. The area between Pontile Norimberga and Pontile Libia is reserved for seaplanes.

Town. — Port facilities. — Communications. — The town of Messina (*Lat.* 38° 11' N., *Long.* 15° 33' E.), which, in 1950, had a population of about 192,000, has twice been destroyed by earthquakes. Its white houses stand in the form of an amphitheatre at the foot and on the lower slopes of the dark-coloured mountains which rise behind this part of the coast. 5

The principal exports are fruit, flour, vegetable oil, wine, etc. 10

There are several hospitals in the town. For deratisation, *see* page 22. A British Consular officer resides in the town.

Fresh provisions can be procured. Water is laid on to the wharves, or can be sent off in tank vessels. 15

A stock of coal is maintained, and fuel oil can be supplied through pipe-lines at certain of the wharves.

For particulars of the dry dock, *see* page 487; repairs can be undertaken. Tugs, including a salvage tug, are available, and also a number of lighters. Cranes, capable of lifting weights up to 3 tons, are available. 20

Frequent steamer communication is maintained with other Italian ports, and with the principal ports in the Mediterranean.

There is a ferry service to the mainland.

A signal station is situated on Punta San Raineri. 25

Chart 3935.

SOUTH-EASTERN SIDE OF SICILY. — Coast. — Capo d'Ali, about 2½ miles south-south-westward of Capo Scaletta (page 458), is a prominent, bluff headland of light colour, close off which lie some above-water rocks. On the southern slopes of the mountains above the cape, at an elevation of 1,426 feet (449^m9), stands the village of Ali Superiore, with a large red cupola at its south-western side which is not visible when bearing less than 300°. The village of Ali Marina stands on the coast about three-quarters of a mile south-westward of Capo d'Ali. 30

From Capo d'Ali the coast trends about 8 miles south-westward to Capo San Alessio, and from it the mountains recede somewhat; it is fronted by a sandy beach and backed by an almost uninterrupted line of villages. 35

The village of Nizza di Sicilia, which, in 1950, had a population of about 3,200, lies about 2 miles south-westward of Capo d'Ali, and close northward of it is the mouth of Fiumara di Fiumendinisi, which is spanned by a bridge with six piers. 40

Castello Saraceno, a dark, square ruin, stands, at an elevation of 2,437 feet (742^m8), on the summit of Monte Belvedere, about 2 miles north-westward of Nizza di Sicilia. 45

Fiumara di Pagliara and Fiumara di Sávoca flow into the sea about 2 and 2½ miles, respectively, south-westward of Nizza di Sicilia. The former is spanned by an iron bridge, with four piers; and the latter by a masonry bridge with seven arches. 50

The mouth of Fiumara d'Agrò, about 2 miles south-westward of that of Fiumara di Sávoca, is spanned by an iron bridge with twelve arches. With westerly and south-westerly winds, especially strong squalls are

Charts 3935, 188, 1976, 198, 165, 1800, 1440, 2158a and b.

Chart 3935.

experienced off the mouth of this river. Between the mouths of the two rivers is the town of Santa Teresa di Riva.

Capo San Alessio, *see* view facing page 472, is the termination of a spur of the mountains with a tower and a redoubt on it. From northward it appears to slope regularly to the sea, and near its extremity are some light-coloured stripes, but from eastward it appears to be faced with rocky cliffs on its southern side. This cape is fringed with rocks close inshore, and a rock, with a depth of 6 feet (1^m8), lies about 10 2½ cables south-south-eastward of the tower.

The village of San Alessio stands on the northern side of the cape; Scoglio San Alessio, a blackish rock, lies close off the southern end of the beach fronting it.

Forza d'Agro (*Lat.* 37° 55' N., *Long.* 15° 21' E.) is a village situated, 15 at an elevation of 1,407 feet (428^m8), on the slope descending to Capo San Alessio; at its eastern end there is a convent with a chapel and a pointed belfry.

From Capo San Alessio, the coast trends about 4 miles south-westward to Capo San Andrea, and in it are the mouths of several small 20 streams.

Monte Veneretta rises to an elevation of 2,897 feet (883^m0) about 1½ miles inland and 4½ miles south-westward of Capo San Alessio.

The village of Letoianni stands on the coast about 2½ miles south-westward of Capo San Alessio, and near its southern end is a large 25 yellow, two-storied, crenellated building, with a turret.

Anchorage.—Small vessels with local knowledge can obtain anchorage, sheltered from southerly winds, off the village of San Alessio, in depths of 5 or 5½ fathoms (9^m1 or 10^m1), sand and good holding ground.

30 *Chart 180.*

Rada di Taormina.—This bay is entered between Promontorio di Taormina and Capo Schisò, about 1½ miles south-westward.

Promontorio di Taormina, the north-eastern, eastern, and south-eastern extremities of which are, respectively, Punta Castelluccio, Capo 35 San Andrea, and Capo Taormina, is dominated by the houses of Castelmola. It is fronted with cliffs and is fringed with rocks extending a short distance offshore. On the north-western side of Punta Castelluccio is a cove, with Scoglio Zigenaro in its approach and some rocks in its entrance; there is a small landing place on its south- 40 ern side, but the cove is available only to small craft. Porto di Castelluccio, on the southern side of Punta Castelluccio, is open eastward, but is available to small craft with local knowledge; in its entrance are two rocks, Scoglio Mazzaro, above water, and the other with a depth of 5 feet (1^m5). A long, low, bright-yellow building 45 stands on Capo San Andrea. The small bay, which is entered between Capo San Andrea and Capo Taormina, is divided into two parts by Isola Bella, which is connected with the shore by a shoal flat. Scoglio Agonia, 60 feet (18^m3) high, lies close off Capo Taormina. Capo Taormina may be identified by the large white clinic on it.

50 The town of Taormina, which, in 1950, had a population of about 6,000, can be identified by its large and brightly-coloured hotels. In the town there are several ancient ruins.

The town of Giardini, which, in 1950, had a population of about 6,000, occupies most of the north-western shore of the bay, and behind

Charts 188, 1976, 165, 1800, 1440, 2158a and b.

Chart 180.

it runs the railway ; in its northern part, near the mouth of Torrente Salina, there is a prominent chimney, 65 feet (19^m8) high, and about 1½ cables south-westward stands a low square belfry.

The north-western shore of the bay is a pebbly beach, close off 5 which there are numerous above-water and sunken rocks, but there are depths of more than 6 fathoms (11^m0) about one-quarter of a mile offshore.

At the northern end of the bay, close to the north-western end of the cliffy part, and about 4 cables north-westward of Capo Taormina, 10 is a small white tower, which stands out from its dark rocky background.

Capo Schisò, low and black, is the extremity of one of the oldest and longest streams of lava erupted by Monte Etna ; on the northern part of the promontory of which Capo Schisò is the eastern extremity, 15 stand Castello Schisò (*Lat. 37° 49' N., Long. 15° 17' E.*), a yellow building surmounted by a square tower, 49 feet (14^m9) high, and a white two-storied hotel.

There are two landing piers in the south-western corner of the bay, near Castello Schisò, but they are dismantled in winter or during bad 20 weather.

Anchorage.—Anchorage can be obtained about 5 cables west-south-westward of Scoglio Agonia, in depths of from 8 to 11 fathoms (14^m6 to 20^m1), sand and good holding ground, or in the southern part of the bay, about 4½ cables northward of Capo Schisò, in similar depths. 25 A local pilot is available. This anchorage is exposed to easterly and south-easterly winds.

Chart 188.

Coast.—From Capo Schisò, a shingle beach backed by woods trends about 6 miles south-westward to Riposto, and is free from off-lying 30 dangers. Between the coast and the foot of Monte Etna is a large cultivated plain in which are many towns and villages, those of Calatabiano, Piedimonte Etneo and Fiumefreddo di Sicilia being prominent from seaward.

The village of San Marco, in which are a remarkable building and a 35 small church, stands on the coast, about 1½ miles south-westward of Capo Schisò, between the mouths of Fiume Alcantara and Fiume Minissale, both of which have little water in them in summer.

Anchorage.—Anchorage can be obtained, in fine weather, anywhere off the coast between Capo Schisò and Riposto, but in the vicinity of a dark red building with a tall chimney, at a short distance 40 northward of Riposto, the bottom is rocky ; at times heavy north-westerly and northerly squalls are experienced.

Chart 188, plan of Riposto.

Riposto.—**Light.**—This town, which, in 1950, had a population of 45 about 11,000, has a cathedral, with a remarkable cupola, and other large buildings. Close inland of Riposto, on slightly higher ground, is the town of Giarre, which, in 1950, had a population of about 12,000 ; in this latter town is a large and prominent church with two belfries. There is a small hospital in Riposto. 50

A light is exhibited, at an elevation of 49 feet (14^m9), from a white tower on a white building, 33 feet (10^m1) in height, situated on Punta del Chiancone, at the southern end of the town. See view facing page 460.

Charts 1976, 165, 1800, 1440, 2158a and b.

Chart 188, plan of Riposto.

A mole, which is quayed on the inside, extends about three-quarters of a cable north-eastward and thence about one cable northward from Punta del Chiacone. This mole is being extended and the extension works are marked by a buoy. A vessel should give the visible head of the mole a berth of at least 165 feet (50^m3).

Anchorage.—Anchorage can be obtained, in fine weather, anywhere off the town (*Lat.* 37° 44' N., *Long.* 15° 13' E.); the holding ground is good and the bottom is of sand. There are two mooring buoys in the harbour. Local pilots are available.

Chart 188.

Monte Etna.—The summit of this very prominent volcano is about 10 miles westward of Riposto; like all volcanoes, its elevation varies from time to time; in 1950, it was about 9,180 feet (2,798^m1) high, in 1936, about 9,190 (2,801^m1), and in 1900, about 10,740 feet (3,273^m5).

On its eastern side, this great volcano rises directly from the sea, into which latter flow several streams of lava, some even projecting under water, as between Acireale and Capo Molini, *see* page 467.

Fiume Alcantara and Fiume Simeto flow round the base of the volcano, the former on its northern side, and the latter on its western and southern sides.

The regular slopes of the mountain are interrupted by a great many secondary cones, or craters, formed along the fractures of the lateral eruptions.

The summit of Monte Etna cannot be said to attain the limits of eternal snow, partly because the heat of the rocks, but more so that of the vapour which is continually escaping from it, causes the snow to melt, more or less quickly, even in winter.

The cultivated slopes of the mountain are amongst the most densely populated parts of the world.

Coast.—Light.—From Riposto, the coast trends about 1½ miles south-south-eastward to a rounded projection on which stands the small village of Torre Archirafi, and thence about 6 miles south-south-westward to Santa Maria la Scala. The beach at Torre Archirafi is stony and dark, and is fronted by rocks; the village shows up well from southward. About 2½ cables southward of Torre Archirafi stands a detached two-storied red building with white window frames.

About 3½ miles southward of Torre Archirafi is a dark and conspicuous projection, formed by a stream of lava. It is low and is fringed with rocks extending a short distance offshore; on its northern side is the village of Pozzillo, dominated by a church with a reddish belfry, and on its southern side is the village of Stazzo, with a church on the sea shore and a remarkable white house with two crenellated towers, one higher than the other, inland of it. At Stazzo is a cove, protected by a small breakwater, where landing can be effected during northerly and north-easterly winds, but local knowledge is necessary.

The village of Guardia stands, at an elevation of 463 feet (141^m1), about 2 miles north-westward of Stazzo; in it is a church with two belfries, surmounted by small cupolas.

The village of Santa Tecla stands on the coast, about one mile south-westward of Stazzo; close northward of it stands a dark-coloured tower, and at the village there is a small boat harbour protected from north-eastward by a breakwater.

Charts 1976, 165, 1800, 1440, 2158a and b.

Chart 188.

Southward of Santa Tecla, the coast becomes high and consists of cliffs of black lava.

Acireale, which, in 1950, had a population of about 37,000, is a prominent town on the cliffs, about $1\frac{1}{2}$ miles southward of Santa Tecla, 5 in which are several cupolas and belfries.

Two small shoals, with depths of $1\frac{1}{2}$ and $2\frac{1}{2}$ fathoms (2^m7 and 5^m0), respectively, lie close together about $2\frac{1}{2}$ cables offshore and three-quarters of a mile southward of Santa Maria la Scala.

Capo Molini, about $2\frac{1}{2}$ miles southward of Acireale, is formed of lava, 10 and some rocks lie close off it. On the southern side of the cape is a cove on the shores of which stands the village of Capo Molini, where there is a factory with a tall chimney. Between Acireale and Capo Molini, the cliffs are composed of alternate layers of lava and clay. 15

A light (*Lat.* $37^{\circ} 35' N.$, *Long.* $15^{\circ} 11' E.$) is exhibited, at an elevation of 138 feet (42^m1), from a white hut on Torre Santa Anna, 67 feet (20^m4) in height, situated on the north-eastern side of Capo Molini. See view facing page 473.

The village of Aci Trezza, which, in 1950, had a population of about 20 3,100, stands on the coast, about one mile south-south-westward of Capo Molini, and most of the houses in it are red in colour. The small fishing harbour at Aci Trezza, protected by a breakwater, has completely silted up.

I Ciclopi (Cyclops) are a group of four basaltic rocks, of prismatic 25 columnar formation, lying close south-eastward of Aci Trezza. Isola di Aci, the largest and northernmost, is surmounted by a small tower, and lies about 2 cables offshore. Il Faraglione lies close southward of Isola di Aci, and is 141 feet (43^m0) high. The passage between I Ciclopi and the coast is only available to boats with local knowledge. 30 I Ciclopi, being of a darker colour than the land behind them, are easy to identify.

The village of Aci Castello is situated on the coast about one mile south-westward of Aci Trezza, and can be identified by a massive rock in front of it, on the summit of which are some ruins. There is a small 35 mole at the village. In 1950, the population was about 3,000.

From Aci Castello, the coast trends about 4 miles south-westward to Catania, and consists of lava cliffs fringed with rocks.

Anchorage.—Anchorage can be obtained, in fine weather, by vessels with local knowledge, in the bay between Capo Molini and 40 I Ciclopi. The holding ground is good, but the bottom is rocky in some places; vessels should put to sea when heavy clouds hang about the crater of Monte Etna, for strong onshore winds may then be expected.

With offshore winds, temporary anchorage can be obtained by vessels 45 with local knowledge, off Aci Castello, in depths of from 11 to 16 fathoms (20^m1 to 29^m3).

Chart 190, plan of Catania.

Coast.—Porto Ulisse (L'Ognina creek) has cliffy sides and a small beach at its head where landing can be effected; it is entered about 50 2 miles south-westward of Aci Castello, see chart 188. On the shores of the cove is the village of Ognina; westward of the village stands a conspicuous chimney.

Anchorage.—With offshore winds, small vessels with local knowledge

Charts 187, 165, 1800, 1440, 2158a and b.

Chart 190, plan of Catania.

can obtain anchorage in Porto Ulisse; the holding ground is good, the bottom being of sand and weed.

PORTO DI CATANIA.—This harbour is protected eastward by 5 Molo di Levante, which extends about one mile southward from the coast. Molo di Mezzogiorno extends about 2 cables eastward from the coast on the southern side of the harbour; from the south-eastern corner of this mole, a spur projects about 200 feet (61^m0) eastward.

A triangular mole has been constructed, on the western side of Molo 10 di Levante, abreast Molo di Mezzogiorno, and the entrance of the harbour, between it and the spur extending from the latter mole, is about 820 feet (249^m9) wide.

Sporgente Centrale extends about 3 cables southward from the head of the harbour and divides the northern part into two basins, the 15 western being Porto Vecchio and the eastern Porto Nuovo.

About 1½ cables from the head of Porto Nuovo, transverse moles extend about one-quarter of a cable from Sporgente Centrale and Molo di Levante.

The quays along the western side of Porto Nuovo are connected with 20 the railway system. On the western side of the harbour lies Banchina Francesco Crispi, from the southern end of which a fishing harbour extends about one cable southward; the entrance faces southward and is about one-quarter of a cable wide.

In 1950 the harbour was available to vessels 656 feet (199^m9) in 25 length, drawing up to 26 feet (7^m9).

Strong north-easterly and south-easterly winds send a swell into the harbour.

The Port office is on the northern side of Porto Vecchio and close north-eastward of it is the custom house.

30 **Lights.**—**Buoyage.**—A light is provisionally exhibited from the head of Molo di Levante.

A light is exhibited, at an elevation of 44 feet (13^m4), from a grey, iron structure, 46 feet (14^m0) in height, situated on the triangular mole on the western side of Molo di Levante.

35 A light is exhibited, at an elevation of 51 feet (15^m5), from an iron framework structure on a red masonry hut, 41 feet (12^m5) in height, situated on the head of the spur extending from the south-eastern corner of Molo di Mezzogiorno.

Warping buoys are established in both Porto Vecchio and Porto 40 Nuovo (*Lat. 37° 30' N., Long. 15° 07' E.*).

Pilotage.—Pilotage is compulsory; see page 20.

Anchorage.—**Regulations.**—It is dangerous to enter the port during south-easterly gales.

Open anchorage can be obtained, south-eastward of the head of 45 Molo di Levante, in depths of about 11 fathoms (20^m1), good holding ground; but vessels should put to sea, or seek shelter in the harbour, on any indication of fresh onshore winds.

Berth No. 13, the first berth on the eastern side of Sporgente Centrale, is assigned to naval vessels drawing not more than 30 feet 50 (9^m1). Two berths for smaller vessels are available on the western side of Sporgente Centrale.

When a seaplane is about to arrive or depart, a green flag will be displayed at the flagstaff on the Port office.

Charts 187, 188, 165, 1800, 1440, 2158a and b.

Chart 190, plan of Catania.

All that part of the harbour westward and northward of an imaginary line joining the north-eastern corner of Molo di Mezzogiorno and the south-western corner of Sporgente Centrale is assigned to aircraft, but only when the weather is suitable for flying. *See also page 23.* 5

City.—Port facilities.—Communications.—Catania (*Lat. 37° 30' N., Long. 15° 06' E.*), which, in 1950, had a population of about 285,000, is the largest city in Sicily, and has many times been damaged by earthquakes. It stands at the edge of a large, fertile plain, and in its eastern part are a number of factories with prominent chimneys. 10 Sulphur, lava, oranges, lemons, wine, dried fruits, oil, etc., are exported. There is a flourishing fishing industry.

A time-ball is dropped on the roof of the observatory, about 6 cables west-north-westward of the Port office. For details, *see Admiralty List of Lights, Vol. 5.* 15

There are several hospitals. For deratisation, *see page 22.*

Provisions can be obtained. Water is laid on to some of the wharves, or is supplied by tank-vessel. A stock of coal is maintained.

Repairs can be executed. There are several cranes; the maximum capacity is 7 tons. There are numerous lighters. A diver is available. 20

There is regular steamer communication with other Mediterranean ports.

Climatic table.—*See page 61.*

Chart 187.

COAST.—From Catania the coast trends about 11 miles southward, and, in contrast to the coast northward of it, consists of a long stretch of sandy beach, near the middle of which Fiume Simeto flows into the sea. 25

Northward of the mouth of Fiume Simeto are the richly cultivated plains previously mentioned. 30

Fiume Simeto is one of the largest rivers in Sicily, but it has little water in it except after heavy rains, or during the melting of the snow on the mountains. A conspicuous radio mast is situated about 1½ miles southward of the mouth of this river. 35

Southward of the mouth of the river, the plain, the southern half of which is marshy and the northern half of which has been reclaimed, is backed by gently rising hills.

From a dark house, once known as Torre dell'Agnone and now re-conditioned, about 11 miles southward of Catania, the coast trends about 3½ miles east-south-eastward to Punta Bonico, and, becoming high and cliffy in places, is fringed with rocks, backed by hills, and skirted by a railway. 40

Anchorage.—Open anchorage can be obtained, in depths of from 6½ to 7½ fathoms (11^m9 to 14^m2), off the above-mentioned dark house 45 but it is dangerous during onshore winds.

Chart 181.

Coast.—Lights.—The village of Brucoli stands in the south-western corner of a cove, which is entered between Punta Bonico, *see chart 187*, and Punta Carnarotta, the north-western extremity of 50 Capo Campolato, about 1½ miles eastward. Close northward of this village is an ancient castle with four towers, one at each corner, on the north-western side of which is the entrance of a narrow creek available

Charts 187, 188, 165, 1800, 1440, 2158a and b.

Chart 181.

only to small craft ; there is a remarkable lime kiln about $2\frac{3}{4}$ cables westward of the castle.

A light (*Lat.* $37^{\circ} 17' N.$, *Long.* $15^{\circ} 11' E.$) is exhibited, at an elevation of 43 feet (13^m1), from a tower with a red horizontal band, 41 feet (12^m5) in height, attached to a grey building, situated about $1\frac{1}{2}$ cables south-eastward of the castle.

Capo Campolato is low and flat, with whitish rocky outcrops, and is fringed with rocks, but is otherwise steep-to. From the cape, well cultivated land, with olive groves in places, slopes gently to the summit of a hill, 300 feet (91^m4) high, about one mile southward of it.

From Capo Campolato, the coast trends about 4 miles south-eastward to Capo Santa Croce, and is rocky and fringed with rocks close inshore, but there are no off-lying dangers.

Capo Santa Croce is low and rocky, and on it are some buildings. Scoglio Stoneddo is a low rock situated close off the cape, and a shoal bank extends about $1\frac{1}{2}$ cables from the cape.

A light is exhibited, at an elevation of 95 feet (29^m0), from a white, circular tower and dwelling, 89 feet (27^m1) in height, situated on Capo Santa Croce. See view facing page 472.

Anchorage.—Anchorage, sheltered from all but northerly winds, can be obtained about $2\frac{1}{4}$ cables north-eastward of the castle at Brucoli, in a depth of about 10 fathoms (18^m3), rock and weed.

Chart 187.

Coast.—Between Capo Santa Croce and Capo Santa Panagia, about $8\frac{1}{2}$ miles south-south-eastward, is a large bight divided into two parts by Penisola Magnisi, situated about 4 miles north-westward of Capo Santa Panagia. The northern part is Baia di Augusta and the southern Baia di Santa Panagia, see page 474. The western shore of the bight is backed by a chain of flat-topped hills, which decline in elevation towards Capo Santa Panagia, and the crest of which is broken only by a hill, 614 feet (187^m1) high, and surmounted by Torre di Belvedere, about $4\frac{1}{2}$ miles westward of the cape.

Chart 181.

BAIA DI AUGUSTA.—Dangers.—This bay is divided into three parts, namely, Porto Xifonio, Porto Megarese, and Seno di Priolo.

Punta San Elia, about 6 cables south-south-westward of Capo Santa Croce, is fringed by a shoal bank, with some rocks on it, extending about half a cable offshore, and about $3\frac{1}{2}$ cables west-south-westward of it is Punta Izzo.

Porto Xifonio is entered between Punta Izzo and Isolotto di Augusta, about one mile south-westward. On the north-eastern side of the bay are some remarkable quarries, and a number of small piers for loading stone ; at its head are some salt pans. The head and western side of the bay are shoal, and Secca di San Francesco, with a depth of $2\frac{1}{2}$ fathoms (4^m6), is a detached shoal situated within about 4 cables of the middle of the eastern side of Isolotto di Augusta.

Isolotto di Augusta is easily identified, for on it stands the town of Augusta. It is connected with the mainland northward of it by two bridges, under which boats may pass from Porto Xifonio to Porto Megarese (*Lat.* $37^{\circ} 14' N.$, *Long.* $15^{\circ} 13' E.$). The cathedral, the belfry of which is 166 feet (50^m6) in height and is damaged, is a conspicuous object in the town.

Charts 165, 1800, 1440, 2158a and b.

Chart 181.

Torre Avalos is a conspicuous detached fort situated about $2\frac{1}{2}$ cables southward of the southern extremity of Isolotto di Augusta. In this fort there are a circular tower 58 feet (17^m7) in height, a framework mast 121 feet (36^m9) in height, and a signal station painted black and white in chequers. 5

Torre Giroto is easily identified and stands about 4 cables westward of Punta Bagnoli, about $2\frac{1}{2}$ miles south-westward of Torre Avalos, with the prominent village of Priolo about one mile southward of it.

Chart 187.

10

The town of Melilli, which, in 1950, had a population of about 6,500, is situated, at an elevation of 984 feet (299^m9), on the slope of the hills about 3 miles north-westward of Priolo. Both show up well from seaward.

A chimney, 230 feet (70^m1) high, which at night is marked by red lights, one on the summit and one about half-way up it, is situated $2\frac{1}{2}$ miles westward of Torre Avalos (*Lat.* $37^\circ 13' N.$, *Long.* $15^\circ 14' E.$). 15

Chart 181.

Storm signals.—Storm signals are shown from the signal station at Torre Avalos. See page 12. 20

Porto Megarese.—**Shoals.**—This harbour is the middle part of Baia di Augusta, and is protected on its eastern side by Isolotto di Augusta and three breakwaters, built over a chain of shoals.

Diga Settentrionale extends about $11\frac{1}{2}$ cables south-south-eastward from the southern extremity of Isolotto di Augusta, passing over Secca Avolos and about $1\frac{1}{2}$ cables eastward of Torre Avolos. 25

Diga Centrale extends about 6 cables southward, from a position about 2 cables southward of the head of Diga Settentrionale, and thence about one mile south-westward, passing over Secca di Mezzo and Secca Caruzzone. 30

Diga Meridionale extends about 6 cables east-north-eastward from a position on the shore about 3 cables southward of Punta Bagnoli, and thence about $1\frac{1}{2}$ cables north-eastward. Two conical stone beacons, 14 feet (4^m3) in height, stand one close to the northern end of Diga Meridionale and the other about three-quarters of a cable north-north-eastward of the southern end of Diga Centrale. 35

Depths of less than 6 fathoms (11^m0) extend $4\frac{1}{2}$ cables westward of the middle of Diga Settentrionale.

Punta Gennalena lies about $1\frac{1}{2}$ miles north-north-eastward of Punta Bagnoli. Secca Panaro, with a depth of $4\frac{1}{2}$ fathoms (8^m2), rock, lies about $3\frac{1}{2}$ cables east-north-eastward of Punta Gennalena. 40

Punta del Cugno lies about $1\frac{1}{2}$ miles northward of Punta Gennalena. Secca Dreara, with a depth of about 5 fathoms (9^m1), lies about half a mile south-south-eastward of Punta del Cugno.

A wharf with five extending arms is situated at the fuelling base, about 2 cables north-westward of Punta del Cugno: it is about 1,000 feet (304^m8) long with a least depth of 13 feet (4^m0) alongside. The southernmost and longest arm, with a least depth of 16 feet (4^m9) along its north-western side, is used as an oiling jetty: in the approaches to the southernmost arm the least depth is 30 feet (9^m1); elsewhere it is 19 feet (5^m8). On the northern arm are two hand-worked cranes; near the inner end of the south-eastern side of this arm the depths are less than 15 feet (5^m5). 50

Forte Garzia and Forte Vittoria are situated on a shoal bank

Charts 165, 1800, 1440, 2158a and b.

Chart 181.

extending about 4 cables southward from Punta Pila. There is a small, detached, $5\frac{1}{2}$ -fathom (10^m1) patch, situated about one mile north-north-eastward of Punta del Cugno, and about 3 cables north-westward of it is a conspicuous concrete hangar, 244 feet (74^m4) high. About a cable north-eastward of Punta Pila there is a mole with a slipway at its north-eastern end; on the northern side of the mole there is a jetty sheltering a small basin. There are depths off the mole and in the basin of from one to 3 feet (0^m3 to 0^m9). A crane with

10 a capacity of about 5 tons stands on the eastern corner of the mole. A prominent water-tower, 67 feet (20^m4) in height, stands about $1\frac{1}{2}$ cables northward of the mole, and 2 cables further north-eastward is a concrete jetty, at the eastern end of which there is a 5-ton crane, and alongside which is a depth of 4 feet.

15 Porticciolo Terre Vecchie is situated close westward of the root of Diga Settentrionale. This harbour is lined with quays except for the outer part of the breakwater protecting it. There are depths of about 11 feet (3^m4). On the eastern quay there is a travelling crane of 30 tons capacity.

20 Banchina Torpediniere, with depths of from 18 to 22 feet (5^m5 to 6^m7) alongside, is about 1,150 feet (350^m8) in length, and is situated about three-quarters of a mile north-north-eastward of Porticciolo di Terre Vecchie.

Cala del Molo, a small basin with depths of from 10 to 14 feet (3^m0 to 4^m3), is situated close northward of Banchina Torpediniere.

Banchina Pantano Daniele is about 390 feet (118^m9) long, with depths of from 14 to 22 feet (4^m3 to 6^m7) alongside; it is situated about 6 cables northward of Banchina Torpediniere. Close southward of this quay are some oil tanks, a railway station, and a concrete pier,

30 with depths of about 23 feet (7^m0) at its head.

Macchia di San Guiseppe, with a depth of $3\frac{1}{2}$ fathoms (6^m9), lies about 3 cables westward of the northern end of Isolotto di Augusta. Its northern side is marked by a red conical buoy.

Lights.—Buoyage.—A light is exhibited, at an elevation of 40 feet (11^m9), from a black, iron framework structure, with a red lantern, on a black concrete beacon, 41 feet (12^m5) in height, situated about half a cable westward of the head of Diga Settentrionale.

A light is exhibited, at an elevation of 46 feet (14^m0), from a red, iron, framework structure, on a red, conical beacon, 48 feet (14^m6) in

40 height, situated about half a cable south-westward of the northern end of Diga Centrale (*Lat.* $37^\circ 12' N.$, *Long.* $15^\circ 14' E.$).

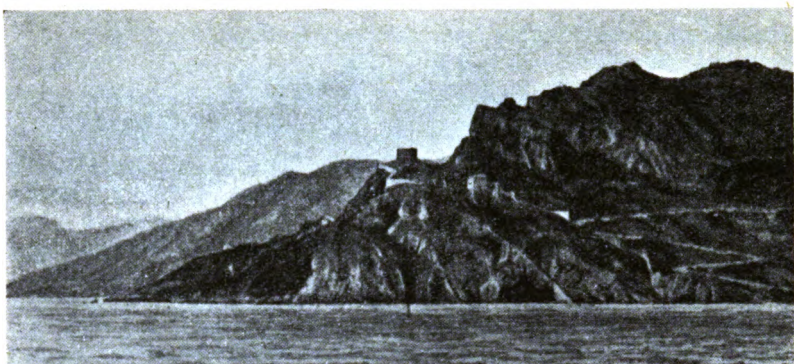
Leading lights are exhibited: the front light, at an elevation of 52 feet (15^m8), from a building surmounted by a quadrangular tower, painted black and white in chequers and 31 feet (9^m4) in height, situated about $1\frac{1}{2}$ cables north-westward of Punta Gennalena; and the

45 rear light, named Dromo Giggia, at an elevation of 259 feet (78^m9), from a similar structure situated about $1\frac{1}{2}$ miles westward of the front light-structure. These lights in line, bearing 274° , lead through the middle of the harbour entrance between Diga Settentrionale and

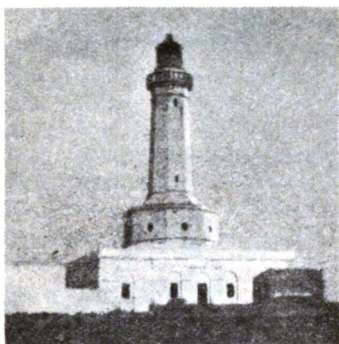
50 Diga Centrale.

A disused light-structure, consisting of a conspicuous black and white chequered tower, 40 feet (12^m2) in height, stands in front of a building on Punta Cantara, about half a mile northward of Punta Gennalena; another disused light-structure, consisting of a rectangular beacon,

Charts 187, 165, 1800, 1440, 2158a and b.



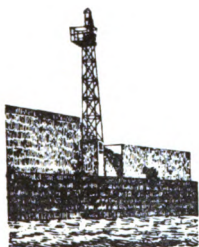
Tower.
Capo San Alessio from north-eastward.
(Original dated 1936)



Cozzo Spadaro
lighthouse.



Isola di Capo Passero
lighthouse.



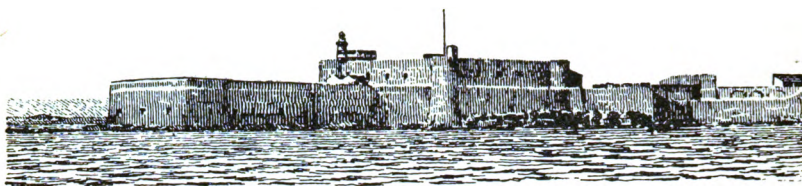
Fossa dell' Isola
Grande lighthouse.



S. Croce lighthouse.
(Originals dated 1942.)



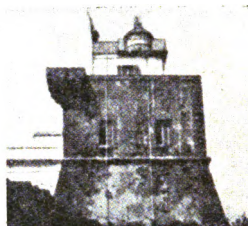
Carrozzieri
lighthouse.



Castello Maniace, bearing 290° .



Magnisi lighthouse from eastward.



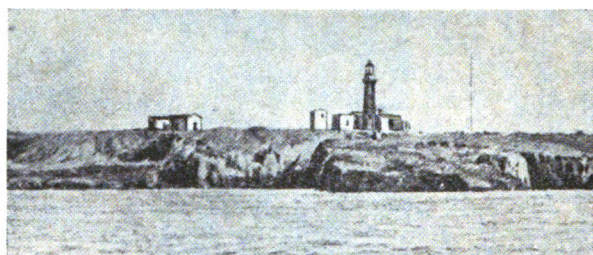
Capo Molini lighthouse.



Punta Castelluccio lighthouse.



Caderini lighthouse.



Capo Murro di Porco, bearing 310° .
(Originals dated 1942.)

Chart 181.

60 feet (18^m3) in height, painted red and white in horizontal bands, stands about 1½ miles westward of Punta Cantara ; these were formerly the leading light-structures for the harbour entrance and should not be confused with the existing ones. 5

Two lights, disposed vertically, are exhibited, at an elevation of 33 and 36 feet (10^m1 and 11^m0), from a red, iron column, 26 feet (7^m9) in height, situated on the head of the breakwater enclosing Porticciolo Terre Vecchie. A light, for the use of aircraft, is occasionally exhibited from the elbow of the above-mentioned breakwater. 10

Lights are exhibited from the heads of the two jetties close north-westward of Porticciolo Terre Vecchie.

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron post on a white hut, 23 feet (7^m0) in height, situated on the southern side of the entrance of Cala del Molo. 15

Two lights are exhibited, at elevations of 23 and 19 feet (7^m0 and 5^m8), respectively, from an iron column, with two platforms, 18 feet (5^m5) in height, situated on the head of the southernmost arm of the jetty about 2 cables north-westward of Punta del Cugno.

Two lights, disposed vertically, are exhibited from an iron mast, 20 18 feet (5^m5) in height, situated on the head of the pier about 4 cables northward of Cala del Molo.

The roof of the conspicuous hangar, 3 cables north-westward of Punta Pila, is marked by *red* obstruction lights.

A red can buoy, surmounted by two red cylinders, is moored about 25 1½ cables north-north-eastward of Punta del Cugno.

Numerous mooring buoys, distinguished by letters, lie in the western part of the harbour, and several red aircraft mooring buoys lie in the bay between Punta del Cugno and Punta Pila. Three mooring buoys, marked, respectively, A1, A2 and A3, are situated about 13 cables 30 north-north-westward, 10 cables north-westward and 6 cables west-south-westward of Torre Avalos, and are for the use of vessels of deep draught.

Anchorage.—Directions.—Anchorage can be obtained anywhere in the harbour in depths of from 9 to 15 fathoms (16^m5 to 27^m4); 35 the bottom is mostly good holding ground of mud, sand, and weed.

Caution is necessary when approaching the harbour in bad weather, for the sea breaks very heavily over the breakwaters.

Pilotage, *see* page 20, is not compulsory, but a pilot is available.

The main entrance is between Diga Settentrionale and Diga Centrale, 40 and vessels must adhere very closely to the line of the leading marks (*Lat.* 37° 12' N., *Long.* 15° 14' E.).

Regulations.—Area reserved for aircraft.—Boats and vessels of any kind are forbidden to navigate at night in Porto di Augusta. By day they must be careful not to impede the manœuvres of other 45 vessels.

Vessels and boats, except naval craft or craft employed on harbour duty, are forbidden to stop, anchor, or fish in an area comprised within a radius of about 4 cables of the light-structure on the breakwater of Porticciolo Terre Vecchie, nor should they approach within a cable 50 of any quays or works of a military character in the harbour.

All craft, other than naval craft, are prohibited from approaching within a distance of one cable any vessels, naval or civil, or submerged wrecks in the harbour.

Charts 187, 165, 1800, 1440, 2158a and b,

Chart 181.

Vessels and craft are forbidden to stop, anchor, or fish in the area reserved for the landing or taking-off of aircraft; this area lies eastward of a line bearing 161° joining Forte Garzia and Diga Centrale.

- 5 **Town.—Port facilities.**—In 1950, the population of Augusta was about 23,000. At the northern end of the town is the old citadel. The principal export is salt. There is a hospital.

Provisions are obtainable. Water is laid on to the quays or can be supplied by water-boat. Small repairs can be executed. There is a

- 10 3-ton crane.

For radio communication, *see* page 21.

- Seno di Priolo.—Dangers.**—Seno di Priolo, in which the depths are less than 5 fathoms (9^m1), is entered between Punta Bagnoli and Punta Tuano, the north-western extremity of Penisola Magnisi, about
15 $1\frac{1}{2}$ miles south-eastward.

Secca Bagnoli, with a depth of $2\frac{3}{4}$ fathoms (5^m0), lies $3\frac{1}{2}$ cables offshore about 4 cables south-eastward of Punta Bagnoli.

From Punta Bagnoli the shore trends about one mile southward to Punta Fico (*Lat.* $37^\circ 09' N.$, *Long.* $15^\circ 12' E.$).

- 20 Secca Saline is a small detached $2\frac{3}{4}$ -fathom (5^m0) patch, almost midway between Punta Fico and Punta Tuano.

COAST. — Dangers. — Light. — Prohibited anchorage. —

- Penisola Magnisi is less than 100 feet (30^m5) high, and is joined to the mainland by a narrow sandy isthmus. On the western side of the
25 peninsula, above the isthmus, stands a large round tower.

A light is exhibited, at an elevation of 48 feet (14^m6), from a white circular tower, 31 feet (9^m4) in height, on a low white group of houses, situated on the eastern extremity of Penisola Magnisi. *See* view facing page 473.

- 30 Secca Magnisi, with depths of less than 6 fathoms (11^m0), extends about $5\frac{1}{2}$ cables north-north-eastward from the eastern extremity of Penisola Magnisi.

- Punta Magnisi is the south-eastern extremity of the peninsula and depths of less than 6 fathoms (11^m0) extend about $2\frac{1}{4}$ cables eastward
35 of it, but it is comparatively steep-to on its southern side.

Tunny nets, *see* page 27, are laid out periodically off the north-eastern side of Penisola Magnisi.

Chart 187.

- Baia di Panagia is entered between Punta Magnisi and Capo Santa
40 Panagia, about $3\frac{1}{4}$ miles south-eastward. Its north-western part, Cala Canaletto, is free from dangers, but depths of less than 5 fathoms (9^m1) extend about 4 cables from its shores. The shore in the southern part of the bay is fringed with rocks extending a short distance offshore.

- 45 Capo Santa Panagia is the north-eastern extremity of a hilly promontory, the sides of which slope gently to the sea. The coasts of the promontory are rocky, but are free from off-lying dangers. Tunny nets, *see* page 27, are laid out annually off the northern side of the above-mentioned promontory. Two framework radio masts, about
50 200 feet (61^m0) high, stand about $1\frac{1}{4}$ miles south-westward of Capo Santa Panagia.

Charts 182, 187.

Punta Spuntone lies about $1\frac{1}{2}$ miles southward of Capo Santa

Charts 165, 1800, 1440, 2158a and b.

Charts 182, 187.

Panagia. About 3 cables northward of the point and three-quarters of a cable offshore, lies Scoglio di Grotta Santa, a detached rock, 40 feet (12^m2) high, with a hole through its base and surmounted by a cross. About 2 cables northward of Punta Spuntone, a spit, with a depth of 16 feet (4^m9) over its extremity, extends about half a cable offshore.

Chart 182.

Punta Spuntone has cliffs on its southern side, and is fringed with yellowish rocks; near it are some caves.

Scoglio Tondo, about half a mile southward of Punta Spuntone, and about 1½ cables offshore, is the outermost of a group of rocks, named Scogli dei Cappuccini, lying on a spit on the northern side of Porto Piccolo, *see* below.

Anchorage.—There is anchorage, in depths of from 5½ to 6 fathoms (10^m1 to 11^m0), in Cala Canaletto. The holding ground of sand over rock is only moderately good.

Porto Piccolo.—Lights.—Porto Piccolo, or Porto Marmoreo, is situated on the northern side of Isola Ortigia, on which latter is part of the town of Syracuse.

A conspicuous war memorial stands about 3¼ cables westward of the entrance to this harbour, and two conspicuous towers are situated on the southern side of the harbour, about half a cable south-westward of the root of the southern entrance mole.

Porto Piccolo is protected by two moles with an entrance, about a quarter of a cable wide, between their heads. The general depths in the harbour are from 7 to 11 feet (2^m1 to 3^m4), but the eastern part of the harbour is shoal; a passage about 50 feet (15^m2) wide, with depths of from 8 to 11 feet (2^m4 to 3^m4), close within the entrance, leads to the main part of the harbour. The southern side of the harbour is faced by Riva Nazario Sauro, close westward of which is a shallow channel leading, under a bridge, to the harbour of Syracuse. There are quays at the western end of Porto Piccolo, and in the south-western corner is a small boat basin. This harbour is liable to silting.

A light is exhibited, at an elevation of 30 feet (9^m1), from a white iron tower with black horizontal bands, 16 feet (4^m9) in height, situated on the head of the northern mole at Porto Piccolo. A light is exhibited, at an elevation of 30 feet (9^m1), from a white, iron tower with red horizontal bands, 16 feet (4^m9) in height, situated on the head of the southern mole.

Coast.—A spit, with depths of less than 18 feet (5^m5), extends about one-quarter of a mile north-eastward from the north-eastern side of Isola Ortigia.

Scoglio del Cane is almost awash, and lies about 1½ cables off the middle of the eastern side of Isola Ortigia; in rough weather the sea breaks heavily over it.

A bank, with depths of less than 36 feet (11^m0), extends about 3¼ cables eastward from the southern part of Isola Ortigia.

PORT OF SYRACUSE.—Shoals.—This harbour, known to the Italians as Porto Grande, is entered between Castello Maniace, on the southern extremity of Isola Ortigia, and Scoglio Castelluccio, lying close off Punta Castelluccio (*Lat.* 37° 02' N., *Long.* 15° 18' E.) about 6 cables south-south-eastward. There are depths of less than 18 feet

Charts 165, 1800, 1440, 2158a and b.

Chart 182.

(5^m5) within three-quarters of a cable south-eastward and south-westward of Castello Maniace, and the point south-eastward of it is fringed with foul ground. A spit, with a depth of 24 feet (7^m3) near its extremity, extends about 2½ cables north-north-westward from the coast close south-westward of Scoglio Castelluccio.

Secca Galera, with a depth of 20 feet (6^m1), lies close westward of the northern end of the above-mentioned spit. Scoglio Galera, an above-water rock, lies about one cable offshore, 4 cables westward of Punta Castelluccio (*Lat.* 37° 02' N., *Long.* 15° 18' E.).

About 3½ cables north-north-westward of Castello Maniace light-structure there is a small pier with a depth of about 8 feet (2^m4) at its head; a flagstaff stands on the pier and the Harbour Master's office is situated nearby. Between this pier and Pontile Zanagora, about 2½ cables northward, the water front is quayed. The general depths alongside the quay are from 9 to 11 feet (2^m7 to 3^m4), but the southern and northern ends are shoal; the northern part of the quay is reserved for naval craft. North-easterly and south-easterly winds cause a sea which meets off this quay and sometimes inconveniences vessels secured to it.

A conspicuous tower stands in the western part of the town, about a cable south-eastward of Pontile Zanagora.

Pontile Zanagora is about 230 feet (70^m1) in length. Vessels drawing up to 24 feet (7^m3) can berth alongside its southern side, and those drawing up to 21 feet (6^m4) alongside its western side; but care must be taken as an escarpment, with depths of less than 20 feet (6^m1), extends about 16 feet (4^m9) from these quays; the northern side is shoal. An obstruction lies close off the south-western corner of Pontile Zanagora. From the root of Pontile Zanagora, a wharf, with depths of from 24 to 26 feet (7^m3 to 7^m9), at a distance of about 50 feet (15^m2) from it, extends north-westward to the entrance to La Darsena.

The area between Pontile Zanagora and Molo San Antonio, about 2 cables westward, has been dredged to depths of from 24 to 30 feet (7^m3 to 9^m1).

La Darsena is the south-western part of a narrow channel spanned by a stone bridge with low arches, which separates the principal part of the town of Syracuse from the mainland. La Darsena is quayed on both sides. There are depths of from 23 to 26 feet (7^m0 to 7^m9) alongside the north-western, and of from 13 to 16 feet (4^m0 to 4^m9) alongside the south-eastern quays. In winter, winds between east-north-east and south-east sometimes give rise to a strong current through La Darsena, which is dangerous to the small craft anchored there.

Immediately north-westward of La Darsena is the railway station, with a wharf alongside which there are depths of from 20 to 28 feet (6^m1 to 8^m5).

Molo San Antonio is a large wharf situated westward of the railway wharf; it extends about one cable southward from the shore. Except in the corners near the shore, there are depths of from 22 to 28 feet (6^m7 to 8^m5) alongside its three sides. This wharf is connected with the railway system.

Molo San Antonio and the area eastward of it are approached by a dredged channel 120 yards (109^m7) wide, with depths of 29½ feet (9^m0),

Charts 187, 165, 1800, 1440, 2158a and b,

Chart 182.

A conspicuous hospital stands about one mile northward of the head of Molo San Antonio.

A seaplane base, with two small jetties and a slipway, is situated about 3 cables north-westward of Molo San Antonio. 5

The western shore of the harbour is low, sandy, and parts of it are marshy; it is fronted by a shoal bank extending as much as 3 cables offshore in places. Fiume Anapo flows into this side of the harbour, and is spanned, near its mouth, by a large, iron bridge.

The southern shore is fronted by a shoal bank and, in places, is 10 fringed with rocks. Casa Dogonale, a conspicuous house, is situated on Punta Spinazza, about three-quarters of a mile south-westward of Punta Castelluccio.

Lights.—Buoys.—Storm signals.—A light is exhibited, at an elevation of 90 feet (27^m4), from a circular tower, 23 feet (7^m0) in 15 height, attached to a small building and painted black and white in horizontal bands, situated in Castello Maniace. *See view facing page 473.* Storm signals, *see page 12*, are shown from the signal station in Castello Maniace.

A light is exhibited, at an elevation of 69 feet (21^m0), from an 20 octagonal turret on a one-storied dwelling, painted red and white in horizontal bands, 28 feet (8^m5) in height, situated on Punta Castelluccio. *See view facing page 473.*

Caderini light is occasionally exhibited, at an elevation of 39 feet (11^m9), from a tower painted red and white in chequers and attached 25 to some white buildings, 28 feet (8^m5) in height, situated near the western shore of the harbour, about half a mile southward of the mouth of Fiume Anapo. *See view facing page 473.*

Carrozzieri light is exhibited, at an elevation of 84 feet (25^m6), from a tower painted red and white in chequers in front of a white 30 building, 49 feet (14^m9) in height, situated half a mile westward of Caderini light-tower. *See view facing page 472.*

Caderini and Carrozzieri lights in line, bearing 267°, lead through the middle of the entrance to the harbour. Caderini light is only exhibited when vessels are entering or leaving the port. It has been reported 35 that the lights of motor cars proceeding along the main road westward of these lights, and intermittently obscured by foliage, can, at times, be mistaken for the lights, and caution is therefore necessary.

A light is exhibited from the north-western side of the south-western entrance to La Darsena (*Lat. 37° 04' N., Long. 15° 18' E.*). 40

Lights are exhibited on the pier at the Port office.

Pilotage.—Anchorage.—Directions.—Pilots, *see page 20*, are available, but previous notice must be given as no look-out is kept. Weather permitting, they will board vessels in the vicinity of Scoglio Tondo or off Punta di Mola, *see page 478.* 45

Anchorage can be obtained as convenient in depths of from 4 to 8 fathoms (7^m3 to 14^m6), mud, but the holding ground is not good. The southern part of the harbour is the deeper, and there the holding ground is better than in the northern part.

There is a mooring buoy for large vessels about 8½ cables, and a set 50 of moorings, marked by a white conical buoy, about 7 cables south-south-westward of Castello Maniace. A warping buoy lies off the south-western corner of Molo San Antonio, and there are a number of aircraft mooring buoys in the north-western part of the harbour.

Charts 187, 165, 1800, 1440, 2158a and b.

Chart 182.

A vessel approaching the harbour from northward should give Isola Ortigia a wide berth so as to clear Scoglio del Cane. She should enter on the line of the leading light-structures, and when Castello Maniace
5 lighthouse bears more than 028° , the vessel will be inside the shoals on either side of the entrance, and course may be altered for the anchorage.

West-north-westerly winds set up a strong current flowing out through the entrance of the harbour.

The area between the western shore of the harbour and an imaginary
10 line drawn from the south-western corner of Molo San Antonio to Punta Callarine, about $11\frac{1}{2}$ cables south-south-westward, is reserved for aircraft, and all vessels must keep clear of it.

Town. — **Port facilities.** — **Communications.** — Syracuse, which, in 1950, had a population of about 60,000, is called by the Italians
15 Siracusa, and is situated partly on Isla Ortigia and partly on the mainland. Oranges, lemons, carobs, asphalt, etc., are exported. There are hospitals. For deratisation, *see* page 22.

Provisions can be procured. Water is laid on to the quays or can be supplied in a tank-vessel.

20 Minor repairs can be executed. There are several small tugs and a number of lighters. A 3-ton crane is situated on the wharf on the southern side of La Darsena; there are also two mobile 5-ton cranes.

Regular steamer communication is maintained with Malta, and ports in Libya and Egypt. There are regular air-services to Napoli, Malta,
25 Tunis, Tripoli, Benghazi and Alexandria.

COAST.—Dangers.—Lights.—Punta di Mola lies about half a mile east-south-eastward of Punta Castelluccio, and between them is Punta Olivera, separating two small coves.

Chart 187.

30 From Punta di Mola, the coast trends about $2\frac{1}{2}$ miles south-eastward to Capo Murro di Porco, and is rocky and steep-to.

Capo Murro di Porco is the south-eastern extremity of Penisola della Maddalena, and consists of steep rocky cliffs about 50 feet (15^m2)
35 (45^m7). Tunny nets, *see* page 27, are laid out annually about one mile northward and westward of Capo Murro di Porco (*Lat.* $37^{\circ} 00' N.$, *Long.* $15^{\circ} 21' E.$).

A light is exhibited, at an elevation of 110 feet (33^m5), from a red tower, 59 feet (18^m0) in height, attached to a building situated on Capo
40 Murro di Porco. *See* view facing page 473.

An area, about 24 miles square, in which Italian naval units may be found exercising, exists close northward and eastward of Capo Murro di Porco.

Baia di Ognina is entered between Capo Murro di Porco and Capo
45 Ognina, about 4 miles west-south-westward. It is free from off-lying dangers. Tunny nets, *see* page 27, are laid out annually in Baia di Ognina.

Capo Ognina is faced with cliffs and surmounted by the inconspicuous ruins of a tower, about one mile west-north-westward of which is
50 another tower, which latter only shows up from southward. Close northward of the cape is Scoglio Ognina, and from the cape a bank, with depths of less than 3 fathoms (5^m5), extends about half a mile southward.

Charts 3670, 165, 1800, 1440, 2158a and b.

Chart 187.

Punta del Cane lies about $2\frac{3}{4}$ miles west-south-westward of Capo Ognina, and, with the exception of the above-mentioned shoal, the coast between them is free from dangers, but within one mile south-westward of Punta del Cane are some rocks awash close inshore. 5
Tunny nets, *see* page 27, are laid out annually near Punta del Cane.

Capo Negro, on which is a hut, lies about $2\frac{1}{2}$ miles south-westward of Punta del Cane. It is low and within half a mile south-eastward of it is a shoal, with a depth of $2\frac{1}{4}$ fathoms (4^m1), over which the sea breaks in bad weather. About midway between the point and the cape is the 10
valley of Fiume Cassibile.

Avola is a town situated on a wooded hill, 130 feet (39^m6) high, about 2 miles west-south-westward of Capo Negro, and is plainly visible from seaward; in 1950, the population was about 24,000. A high chimney stands in the southern part of the town and the centre 15
of the town is dominated by the dark cathedral, which has a square belfry. Lido di Avola, consisting of a few small buildings and a large flat concrete structure near the beach, is close southward of Capo Negro, and is connected with the town by a road, visible from seaward, which terminates close to two prominent red and white columns. 20

Marina di Avola lies on the coast south-eastward of the town, and in it there is a tall chimney.

Calabernardo is a small inlet situated about $1\frac{3}{4}$ miles southward of Marina di Avola, and is the port of Noto; *see* below. A mole extends about 100 feet (30^m5) north-eastward from the shore, affording shelter 25
to fishing boats. La Ballata is a small village situated close to Calabernardo.

Tunny nets, *see* page 27, are laid out annually about half a mile northward of La Ballata.

Noto is a town situated, at an elevation of 525 feet (160^m0), about 30
 $3\frac{1}{4}$ miles west-north-westward of La Ballata; at its northern and southern ends, respectively, are two prominent cupolas. Lido di Noto, on a beach close southward of Calabernardo, consists of a bathing establishment near a white hotel, which forms a good mark.

Colonna Pizzuta stands on the summit of a hill close to the coast, 35
about 2 miles south-westward of La Ballata, and shows up well from seaward; close southward of it is the mouth of Fiumara Tellaro di Noto.

Torre Vendicari is a large, square tower, situated on the coast, about $4\frac{1}{2}$ miles south-south-westward of La Ballata. It is not very notice- 40
able, and on either side of it are some saltpans. Near the tower is a tunny fishery establishment with a tall chimney.

Isolotto Vendicari, about three-quarters of a mile south-south-eastward of Torre Vendicari, is low and rocky; it is joined to the mainland by a low tongue of sand, and on it are two wooden buildings; 45
westward of it are some saltpans. Tunny nets, *see* page 27, are laid out annually in the vicinity of Isolotto Vendicari.

The village of Marzamemi stands on a small rocky projection, fringed with rocks, situated about 3 miles southward of Isolotto Vendicari, and between them the coast is fringed with shoals. Some detached 6-fathom 50
(11^m0) patches lie about one mile east-south-eastward of Isolotto Vendicari and the same distance north-eastward of Marzamemi. Tunny nets, *see* page 27, are laid out annually in the vicinity of Marzamemi (*Lat.* $36^{\circ} 44' N.$, *Long.* $15^{\circ} 08' E.$).

Charts 3670, 165, 1800, 1440, 2158a and b.

Chart 187.

On the southern side of the projection on which stands Marzamemi is a small shallow bay in which lie Isola Piccola and Isola Grande. In the southern part of the bay is a mole giving some protection to Fossa dell'Isola Grande.

Fossa dell'Isola Grande is only available to small craft with local knowledge.

A light is exhibited, at an elevation of 31 feet (9^m4), from a grey iron framework structure, 26 feet (7^m9) in height, situated near the middle of the mole at Fossa dell'Isola Grande. See view facing page 472.

Pachino, a town which, in 1950, had a population of about 22,000, is situated on a hill about 2 miles south-westward of Marzamemi; it has a prominent church, and at its northern end is a very prominent concrete reservoir.

Southward of Fossa dell'Isola Grande, the coast becomes arid and barren.

Midway between Pachino and Isola di Capo Passero there is a large cemetery enclosed by a white wall.

20 Anchorages.—Baia di Ognina affords anchorage, sheltered from winds from between west and north, in depths of about 13 fathoms (23^m8), good holding ground of mud and sand.

With offshore winds, anchorage can be obtained off Marina di Avola, in depths of from 4½ to 5½ fathoms (8^m2 to 10^m1), about 4½ cables offshore. Landing can be effected at a small mole near the building with the tall chimney.

With offshore winds, anchorage can be obtained, by vessels with local knowledge off Lido di Noto.

Small vessels with local knowledge can obtain anchorage between Torre Vendicari and Isolotto Vendicari, or off Marzamemi.

Coast. — **Lights.** — **Signal station.** — **Storm signals.** — Isola di Capo Passero (*Lat.* 36° 41' N., *Long.* 15° 10' E.), steep-sided except at its western end, lies close inshore about 3 miles southward of Fossa dell'Isola Grande. See view facing page 472. Tunny nets, see page 27, are laid out annually north-eastward and east-north-eastward of Isola di Capo Passero.

A light is exhibited, at an elevation of 128 feet (39^m0), from a white circular tower, 62 feet (18^m9) in height, in front of a small building, situated on the eastern extremity of Isola di Capo Passero (*Lat.* 36° 41' N., *Long.* 15° 10' E.).

Cozzo Spadaro, close to the coast westward of Isola di Capo Passero, is a conical hill on which stands a signal station, consisting of a house painted black and white in chequers. Storm signals, see page 12, are shown. Close north-north-eastward of the hill are some buildings, one of which, named Villa Belmonte, is surmounted by a turret and is prominent. Close south-south-eastward of the hill is the village of Portopalo.

A light is exhibited, at an elevation of 271 feet (82^m6), from a white octagonal tower on a white building, 120 feet (36^m6) in height, situated on Cozzo Spadaro. See view facing page 472.

For the eastern end of the southern coast of Sicily, see page 425.

Anchorage.—Anchorage, sheltered from westerly winds, can be obtained about 1½ miles north-north-westward of the lighthouse on Isola di Capo Passero, in depths of 9 or 10 fathoms (16^m5 or 18^m3).

Charts 3670, 165, 1800, 1440, 2158a and b.

APPENDIX I

MALTA

Extracts from Port regulations

(1) No vessel arriving at these islands from any place beyond seas shall enter any port in these islands other than the Grand Harbour or the Marsamxett Harbour.

If any such vessel shall enter any such other port, the master shall forfeit a sum of money not greater than £50 and not less than £2.

(2) No master shall permit any boat to approach his vessel, except pilot boats and steam tugs seeking hire, before the officer charged with such duty by the Superintendent of Ports shall have visited the vessel ; or any person to disembark before the vessel shall have received pratique.

(3) No master of a merchant vessel shall moor his vessel between the mouth of the Grand Harbour and the Senglea point, or keep the said vessel at anchor there for a time longer than necessary to approach the Marina or some mole, or to depart from thence ; or moor the said vessel in the places where the passage boats usually disembark their passengers, or otherwise obstruct the passage of such boats.

(4) No steamer shall be allowed to drop or weigh anchor without a pilot in the area within two lines, the one drawn from Kalkara gate landing-place to Senglea point, and the other from the police station outside Advanced Right Marina gate to Ras Hanzir.

(5) Colliers proceeding in or out of Msida Creek when Nos. 2 and 3 berths, Msida, are occupied, shall only be allowed to do so between sunrise and half an hour before sunset.

(6) During the stay of a ship in harbour tanks or receptacles which have contained petroleum or other oils shall not be cleaned, and no water used for such cleaning shall be allowed to run into the sea within the harbour.

The master of any ship shall be responsible for the infringement of the preceding paragraph by any member of the crew ; he shall likewise take all precautions against possible leakage of oils into harbours, and shall provide for draincocks and valves to be kept properly closed, with the exception of those which may be required for the pumping of oil into the tanks.

(11) No master of a merchant vessel shall fasten his vessel anywhere but to the bollards or rings intended for that purpose ; or fasten with chains the vessel to the said bollards without using a mat or such other means as, in the opinion of the Superintendent of Ports, may be sufficient to prevent the chain from damaging the wharf.

All merchant vessels lying at anchor shall have their anchors and

chains placed so as not to come in contact with the anchor and chains of other vessels, when in boisterous weather they loosen their hawsers from the land.

(12) Every master of a merchant vessel shall prevent any smoking or any fire being kept alight on board, whilst in the act of loading or unloading hemp, esparto grass, or other merchandise of an inflammable nature, until the hatches shall have been secured.

(13) Every master of a merchant vessel shall declare to the said Superintendent the quantity of gunpowder which he may have on board, and shall not approach the mole to unload any merchandise before having deposited such gunpowder in the place pointed out by the said Superintendent ; and in case he has more than three barrels of gunpowder, on entering the port, he shall extinguish all fires, except steaming fires, and shall anchor the vessel in the place which shall be pointed out by the said Superintendent. He shall keep a red flag at the mainmast head until such powder shall have been deposited, and previously to commencing to deposit the same, he shall expressly warn the vessel lying near.

(14) It is prohibited to throw into the ports anything which might cause deposits of mud, or in any other way alter the bottom of the port or obstruct the mouths of the public sewers which discharge into the sea ; or to leave in the ports or on the moles any merchandise or other rotten unwholesome thing which might be prejudicial to the public health or give rise to a nuisance.

(15) The master, or other person in charge of any ship arriving in these islands, shall declare to the Superintendent of the Port the presence of any person who has secreted himself and arrived in such ship, and shall take all reasonable means to prevent such person from landing without the written permission of the said Superintendent and may for this purpose keep the stowaway in arrest during the time such ship is in any of the harbours in these islands, giving notice thereof to the said Superintendent.

(16) The use of the steam whistle, fog horn, or siren, is to be confined to vessels under way, for giving the signals prescribed by the Board of Trade regulations for preventing collisions at sea. Vessels lying at anchor or moored in the harbours are not to use the steam whistle, fog horn, or siren, for any purpose whatever.

(19) Every master of a merchant vessel must exactly follow any instructions which the Superintendent of the Ports may give in regard to the place where his vessel is to lie, and in regard to the position of the said vessel.

(20) Commanders or masters of vessels are hereby warned that, owing to the large number of small craft plying in the harbour at all hours, strict attention should be paid to moorings to prevent their being tampered with.

In the event of any suspicious circumstances, such as boats without lights approaching during the night, the police should be at once communicated with, a message being sent to the Custom-house, if necessary.

(21) No goods shall be discharged on Sundays or public holidays, or on other days except between the hours of 6 a.m. and 6 p.m. from 1st April to 30th September inclusive ; and between 7 a.m. and 5 p.m. from 1st October to 31st March inclusive, unless by special permission of the Collector of Customs.

(23) The master of mail and other steamers having passengers on board shall, with the least possible delay, cause all available accommodation ladders to be lowered on both sides of the vessel.

(24) Every master or owner of a merchant vessel shall during the night keep a guard on board the said vessel ; and shall keep any boat belonging to the said vessel moored and without oars.

(27) Any merchant vessel proceeding to an Admiralty numbered mooring in the Grand Harbour shall hoist the numeral pendant, or pendants (with substitutes, if applicable) indicating such berth, before passing the breakwater.

(29) No master of a merchant vessel shall make fast any chain or rope to any of the buoys laid down for the use of H.M.'s Navy ; or careen his vessel except in one of the places established for that purpose by the Superintendent of the Ports.

Additional Regulations (1921) for maintenance of good order in the Grand and Marsamxett harbours.—

1. In these regulations—

“Grand harbour” comprises all waters in that harbour inside and to the westward of a line drawn south (true) from the outer extreme of St. Elmo breakwater to Ricasoli ;

“Marsamxett harbour” comprises all waters in that harbour south-westward of a line drawn between the outer extreme of St. Elmo breakwater and Dragut point ;

“Vessel” means any ship, boat or other seagoing craft destined to navigate to any place out of the limits of these islands ;

“Boat” includes all classes of craft not being destined to navigate to any place out of the limits of these islands.

“Service boat” includes any boat belonging to the Royal Navy, the Army, the Royal Air Force, the Malta Government, or to any foreign Men-of-War.

2. All vessels when inside the Grand or Marsamxett harbours shall carry such lights as are prescribed by the Regulations for preventing collisions at sea in force and shall also observe the steering and sailing rules set forth in such regulations, except in so far as they are affected by these Regulations.

3. When, by day, the red flag is hoisted at the dip, or by night when three *red* lights disposed vertically are exhibited, in each case at Fort St. Angelo and on the Palace tower, a merchant vessel in charge of a pilot may enter or leave Grand harbour for the purpose of berthing, in or leaving the Fishmarket anchorage, but may not proceed south-westward of a line joining Custom House and Fort St. Angelo flagstaffs. All other merchant traffic is to cease.

4. A merchant vessel, when in charge of a pilot, shall display International Code flag “H” by day and exhibit an all-round *white* light over an all-round *red* light at night.

5. The movement of vessels of 500 gross registered tons or over shall be regulated by the following other signals, namely :—

(a) A red diamond (double cone) displayed by day and *red* lights in the form of a diamond exhibited at night at the Palace tower and repeated by Fort St. Angelo shall signify that vessels may enter but not leave the Grand harbour.

(b) Two red diamonds, one above the other, displayed by day and three *red* lights, disposed horizontally, exhibited at night, at the Palace tower and repeated by Fort St. Angelo shall signify that vessels may leave but not enter the Grand harbour.

(c) Traffic signals will not be shown for vessels of under 500 gross registered tons.

6. Within the waters of the harbours all vessels shall proceed at slow

speed ; when there is a heavy swell at the entrance of the harbours the speed shall be so regulated as not to lose command of the vessel, being subsequently eased on arrival inside.

7. Vessels in the fairway of the harbours, as distinguished from the creeks thereof, shall have the right of way over vessels entering or leaving the creeks or crossing the fairway, and the latter shall keep clear.

For the purposes of these Regulations, the recognised fairway in the Grand harbour extends from the Breakwater entrance, past the mouths of Dockyard and French creeks, and south-eastward of Admiralty buoys Nos. 5, 6, 7 and 8.

Vessels shall keep in the middle of the fairway as much as possible, except in the case of meeting another vessel, when Article 25 of the Regulations for preventing collisions at sea is to apply. Vessels going in the same direction shall not attempt to pass one another in the fairway.

8. All vessels entering the fairway from the creeks shall indicate their intention of so doing by sounding *one long* blast on the whistle or siren, provided no other vessel under way is in sight ; vessels under way in the fairway in the vicinity shall reply with *one long* blast.

All vessels entering the creeks from the fairway shall make the sound signals prescribed in Article 28 of the Collision Regulations regarding vessels in sight of one another.

9. Vessels preparing to enter the creeks shall keep a good look-out and be prepared to meet similar vessels leaving therefrom, and shall remain in the main fairway if necessary until the creek is clear for entering.

10. When any steam vessel, tug towing a vessel, or vessel in charge of Dockyard tugs within the limits of the harbours shall, by reason of the crowded nature of the harbour or the narrowness of the navigable water, find it unsafe or impracticable to keep out of the way of a sailing vessel or boat under steam, oars or mechanical power, she shall signify the same in good time to such vessel or boat by sounding four short blasts in quick succession, and such vessel or boat shall keep clear, provided always that the first-named vessels are navigated with due care and when possible on their own starboard side of the fairway ; provided also that the said blasts shall not be obligatory in the case of Article 3 of these Regulations.

11. Vessels in the fairway shall so adjust their speed as not to interfere with vessels entering Dockyard creek ; these latter vessels usually proceed down the creek stern first and this procedure necessitates their getting across the main fairway opposite the custom house. Vessels intending to enter this creek are not to be turned so as to place themselves across the main fairway if another vessel is close at hand in the fairway, but shall wait until such vessel has passed.

12. The fairway in Dockyard creek is north-eastward of the main line of ships, mooring buoys, as indicated on Admiralty charts in that creek, and between them and the small moorings laid on the north-eastern side of the creek.

13. Vessels of 1,000 tons displacement and upwards shall not attempt to pass one another at or near the Breakwater entrance to the Grand harbour ; the incoming vessel shall remain outside until the outgoing vessel is clear.

14. All boats shall keep out of the way and take all possible precautions in good time to prevent their getting into an awkward position when Dockyard tugs are turning heavy ships into their berths in the

harbours or manœuvring in the narrow creeks with vessels alongside them on the way to or from docks or wharves.

16. Anchorage is prohibited in the area shown in pecked lines on chart 974, between the entrance to Dockyard creek and Valetta.

17. In the event of the anchor of a vessel hooking any Government moorings or moorings of buoys, the master or other person having charge or command of such vessel shall not proceed to unhook the same, but shall forthwith give notice thereof to the King's Harbour Master in order that aid may be given for clearing such moorings or cables without doing damage to the same.

18. Vessels or boats towing lighters within the harbours shall proceed cautiously and shall keep clear of vessels as mentioned in Articles 3 and 10 of these Regulations, provided the signals therein mentioned are made or displayed as aforesaid, and in all other cases shall obey the Rule of the Road. Their tows shall be capable of being slipped if such a course is advisable when in risk of collision. The towing vessel or boat shall carry the lights mentioned in Article 3 of the Collision Regulations, and the vessel being towed shall either carry the lights prescribed in Article 5 of the Rule of the Road or else an all round white light astern.

19. Steam launches or boats are not permitted to tow more than three lighters in single line. When navigating the harbour by night, without a tow, they are to proceed at moderate speed.

20. When an Admiralty tug is employed to assist a Merchant vessel in the harbour, or proceeding to or from a berth, the Merchant vessel having on board a Civil pilot, the Master of the Admiralty tug, or another Admiralty Tug-master, if so instructed by the King's Harbour Master, shall act as pilot.

The Admiralty Tug-master shall carry out the duty of pilot from the time the first tug is secured until the last tug is cast off.

If, however, an Admiralty tug is employed to hold a Merchant vessel in her berth, or assist in sailing, without securing alongside, the Civil pilot will be in charge, unless it becomes necessary to employ two or more Admiralty tugs.

21. When a vessel has been berthed, she is not, except if in danger due to weather, to move to another berth without permission from the Superintendent of the Ports.

Regulations Nos. 22, 23, 24 and 25 not applicable.

26. The steam whistle or siren is to be used only by vessels under way, as laid down in the regulations for preventing collisions at sea. It is not to be used for any purpose by vessels at anchor.

Regulations Nos. 27, 28, 29 and 30 not applicable.

31. Any person who acts in contravention to the foregoing Regulations shall be liable to the punishments laid down by the Criminal Laws for contraventions (reprimand or admonition, fine, detention, imprisonment or hard labour).

APPENDIX II

LIST OF PORTS AVAILABLE FOR UNDER-WATER REPAIRS, with Details of Largest Dry or Floating Dock or Patent Slip at each Port.

NAME OF PORT AND TYPE OF DOCK, &c.	Length from bilge of caisson or mitre post of gates at		Maxi- mum length of keel blocks	Breadth of entrance at		‡ Distance {below (+) above (-) Chart datum level of			Springs rise	FLOATING DOCKS, PATENT SLIPS, &c.				REMARKS			
	Coping head	Floor head		(1)*	(2)*	(3)	(4)†	(5)†		Blocks, at		Maximum depth over blocks			Lifting power		
										Sill	Entrance		Head			Forward (10)	Aft (11)
											(6)	(7)					
MÁLAGA . . F.D.	229.5	—	—	—	46.0	—	—	—	—	13.0	13.0	1,700	L-shaped, 4 sections				
CARTAGENA . G.D.	684.0	—	—	102.7	91.7	+ 31.7	+ 29.3	+ 26.3	—	—	—	—					
VALENCIA . . F.D.	360.7	295.2	—	—	66.6	—	—	—	—	17.4	17.4	4,000					
BARCELONA . F.D.	472.0	367.0	—	—	60.0	—	—	—	—	20.0	20.0	6,000					
PUERTO DE MAHÓN F.D.	344.5	310.0	—	—	41.8	—	—	—	—	23.9	23.9	2,000					
MERS-EL-KEBIR F.D.	393.7	—	—	—	64.0	—	—	—	—	24.6	24.6	3,000					
ORAN . . . F.D.	721.7	678.4	—	—	112.0	—	—	—	—	28.7	28.7	25,000					

* In the case of Floating Docks, Patent Slips, &c., column (1) = Extreme length; column (2) = Length on blocks or cradle.

† In the case of Floating Docks, column (4) = Breadth at top; column (5) = Breadth at bottom of dock.

‡ In order to find the depths on Sill, &c., the quantities in columns (6), (7) and (8) should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

L-shaped, 4 sections

List of Ports available for Under-water Repairs, with Details of Largest Dry or Floating Dock or Patent Slip at each Port—*continued*.

NAME OF PORT AND TYPE OF DOCK, &c.	Length from bilge of caisson or mitre post of gates at		Maxi- mum length of keel blocks	Breadth of entrance at		‡ Distance (below (+) (above (-)) Chart datum level of				Springs rise	FLOATING DOCKS, PATENT SLIPS, &c.			REMARKS
	Coping head (1)*	Floor head (2)*		Coping (4)†	MHWS level (5)†	Sill (6)	Blocks, at		Lifting power (12)		Maximum depth over blocks			
							Entrance (7)	Head (8)			Forward (10)	Aft (11)		
													Feet	
ALGIERS . . G.D.	455·3	422·0	—	74·0	59·0	+ 24·7	+ 24·7	—	—	—	—	—	M.H.W.S. to C.D. 2·3'	
BIZERTA . . G.D.	830·0	800·0	—	133·0	—	+ 38·7	—	—	—	—	—	—	M.H.W.S. to C.D. 1·2'	
LA GOULETTE G.D.	200·0	193·5	—	—	30·0	+ 11·1	—	—	—	—	—	—	M.H.W.S. to C.D. 1·4'	
MALTA . . . G.D. F.D.	836·5 875·5	830·0 847·0	— —	95·0 —	93·7 126·5	+ 33·0 —	+ 32·4 —	+ 31·3 —	— —	— —	— 40·0	— 50,000	M.H.W.S. to C.D. 1·3'	
PALERMO . . G.D.	578·0	561·0	—	104·0	89·8	—	+ 24·9	+ 21·9	—	—	—	—	M.H.W.S. to C.D. 1·0'	
MESSINA . . G.D.	343·1	341·1	—	71·5	52·7	—	+ 23·1	+ 21·1	—	—	—	—	M.H.W.S. to C.D. 0·6'	

* In the case of Floating Docks, Patent Slips, &c., column (1) = Extreme length; column (2) = Length on blocks or cradle.

† In the case of Floating Docks, column (4) = Breadth at top; column (5) = Breadth at bottom of dock.

‡ In order to find the depths on Sill, &c., the quantities in columns (6), (7) and (8) should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

APPENDIX III

LIST OF PRINCIPAL PORTS WITH PARTICULARS
OF DEPTHS, &c.

PORT	Depth below chart datum level		REMARKS
	In channel of approach	At berths	
Puerto de Málaga	5½ to 7 fms. . .	23 to 30 ft. . .	Inner harbour with depths of from 13 to 21 ft.
Almeria	7 fms.	20 to 30 ft. . .	
Puerto de Cartagena . . .	5½ to 12 fms. . .	23 to 26 ft. . .	
Puerto de Alicante . . .	6 to 7 fms. . . .	23 to 37 ft. . .	
Puerto de Valencia . . .	7 to 10 fms. . .	30 ft.	Inner harbour 13 to 31 ft.
Puerto de Tarragona . .	6 to 8 fms. . . .	27 to 33 ft. . .	
Barcelona	6 to 9 fms. . . .	22 to 52 ft. . .	Small harbour, depths 20 ft. Outer anchorage, 5 to 9 fms.
Puerto de Iviza	4 to 8 fms. . . .	5 to 8 fms. . . .	
Palma	6 to 9 fms. . . .	14 to 28 ft. . .	
Puerto de Mahón	6½ fms.	5 to 11 fms. . .	
Porto di Cagliari	6 to 8 fms. . . .	18 to 38 ft. . .	Six basins. Available to vessels 410 ft. in length. Available to vessels 393 ft. in length drawing 21 ft. Available to large vessels. Three basins.
Rade di la Maddalena . .	Deep	3 to 12 fms. . .	
Rada di Santo Stefano . .	Deep	3 to 23 fms. . .	
Olbia	21 ft.	12 to 20 ft. . .	
Oran	10 to 14 fms. . .	24 to 32 ft. . .	
Mostaganem	7 to 10 fms. . .	26 ft.	
Tenes	6½ to 10 fms. . .	13 to 24 ft. . .	
Algiers	Deep	5 to 10 fms. . .	
Bougie	7 to 10 fms. . .	30 ft.	
Djidjelli	9 fms.	13 to 23 ft. . .	
Philippeville	7 to 10 fms. . .	3 to 7 fms. . . .	Available to vessels 500 ft. in length drawing 26 ft. Available to vessels 590 ft. in length drawing 29½ ft. Available to vessels 656 ft. in length drawing 29½ ft. Depths of from 15 to 30 ft. along- side. Depths of from 9 to 27 ft. along- side.
Bône	6 to 7 fms. . . .	26 to 33 ft. . .	
Bizerta	5 to 5½ fms. . .	25 to 32 ft. . .	
Lake Bizerta	32 ft.	5 to 6 fms. . . .	
La Goulette	28 ft.	28 ft.	
Tunis	21 ft.	22 ft.	
Sfax	21 ft.	24 ft.	
Valetta	Deep	Over 5 fms. . .	
Marsaxlokk	Deep	6 to 16 fms. . .	
Porto di Trapani	5 to 10 fms. . .	—	
Porto Empedocle	4½ fms.	19 to 23 ft. . .	Available to vessels 590 ft. in length drawing 29½ ft. Available to vessels 656 ft. in length drawing 29½ ft. Depths of from 15 to 30 ft. along- side. Depths of from 9 to 27 ft. along- side.
Porto di Palermo	11 to 16 fms. . .	—	
Porto di Messina	Deep	—	
Porto Megarese	Deep	5 to 15 fms. . .	
(Augusta)			
Syracuse	Deep	18 to 60 feet .	

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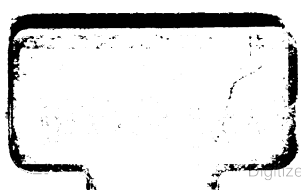
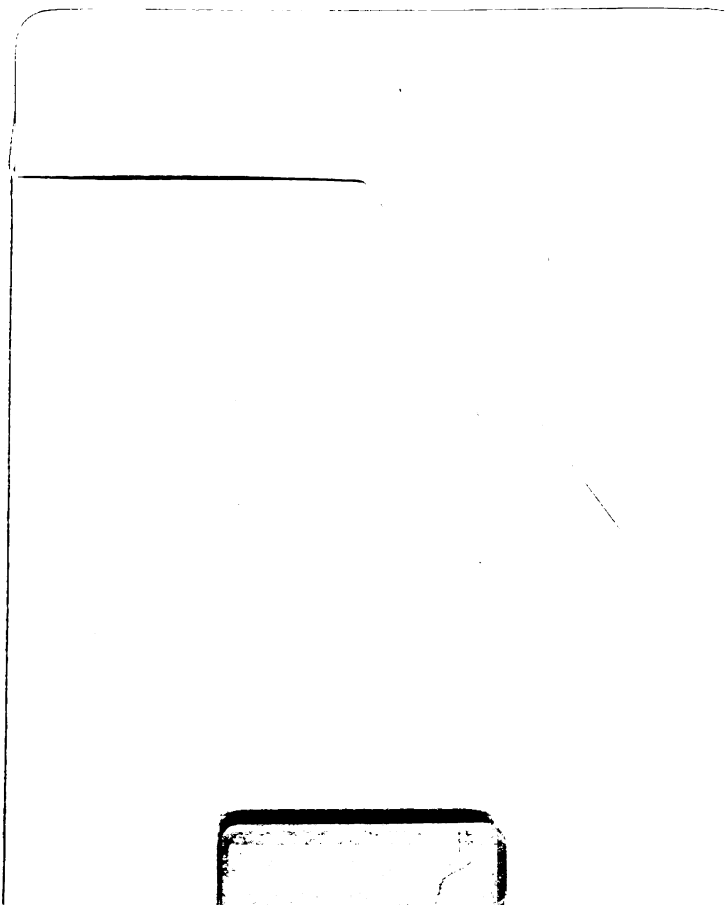
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